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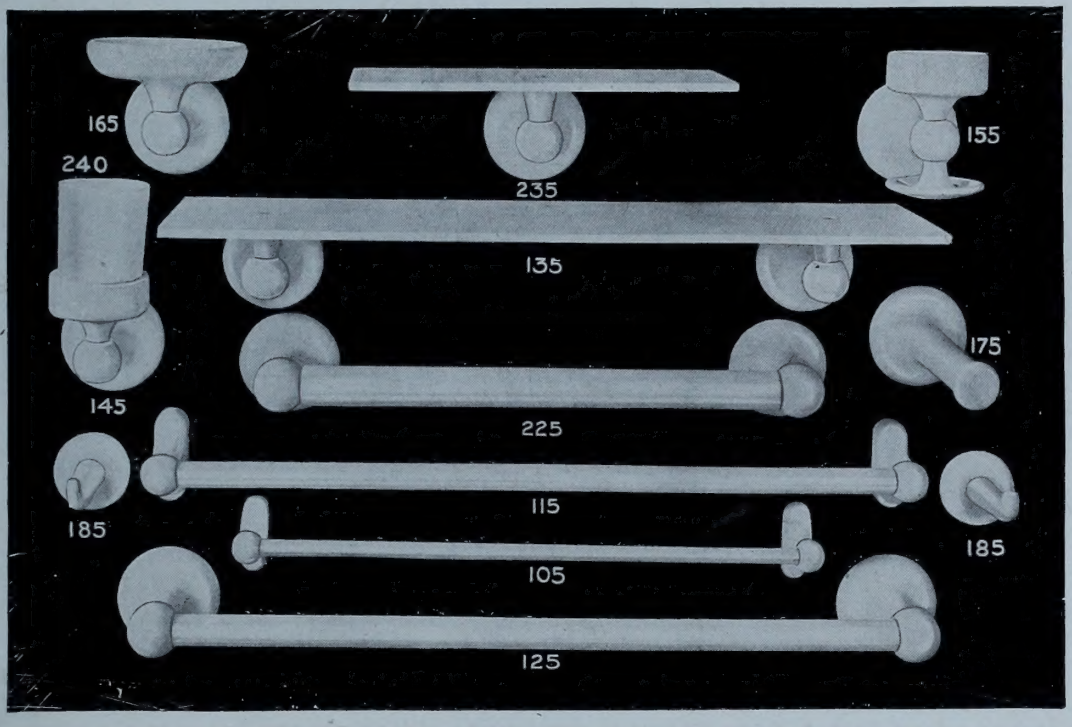
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PLUMBER & STEAM FITTER of CANADA

Vol. XII. Publication Office, Toronto, January 1st, 1918 No. 1

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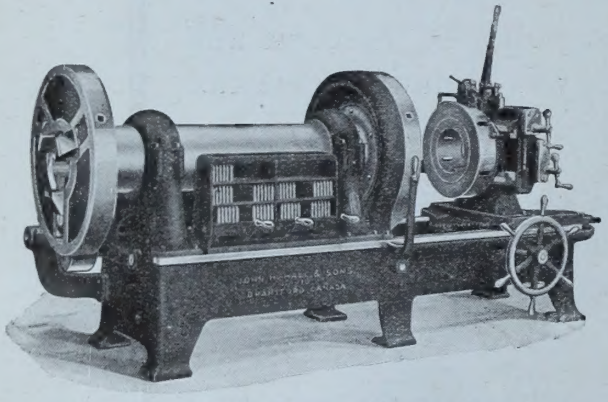
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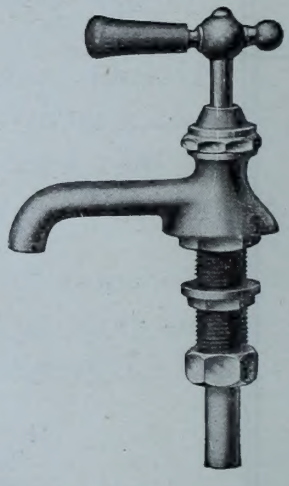
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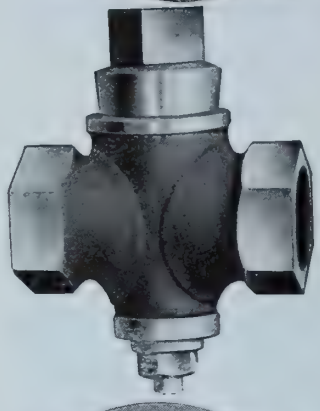
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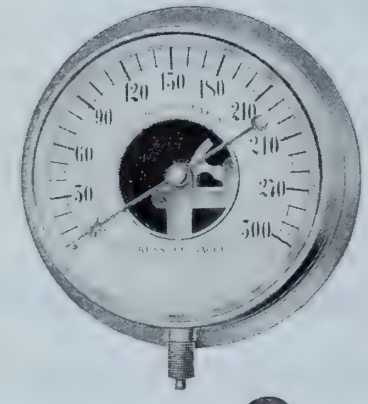
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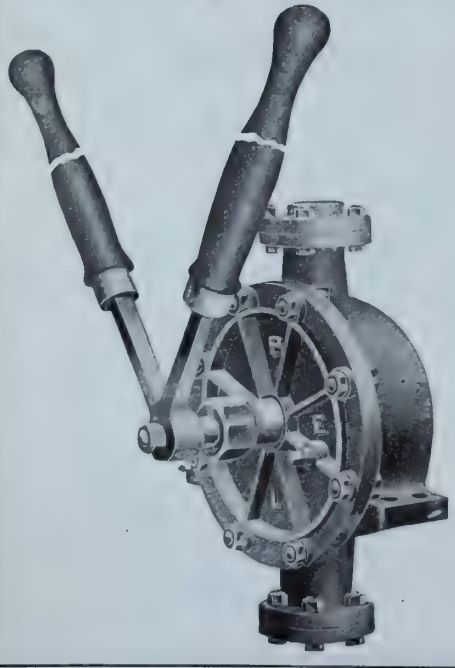
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December 13, 1909, in their plant at Port Huron, Michigan, the Studebaker Corporation installed their first MOREHEAD BACK TO BOILER SYSTEM.

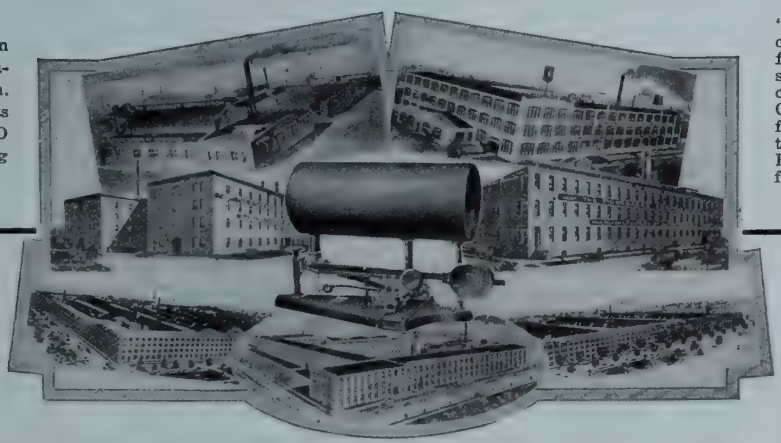
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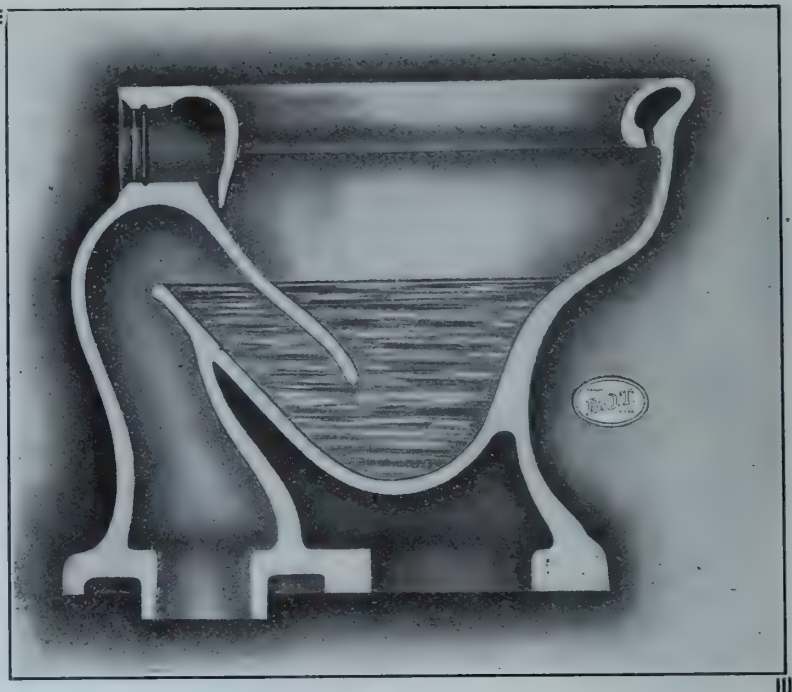
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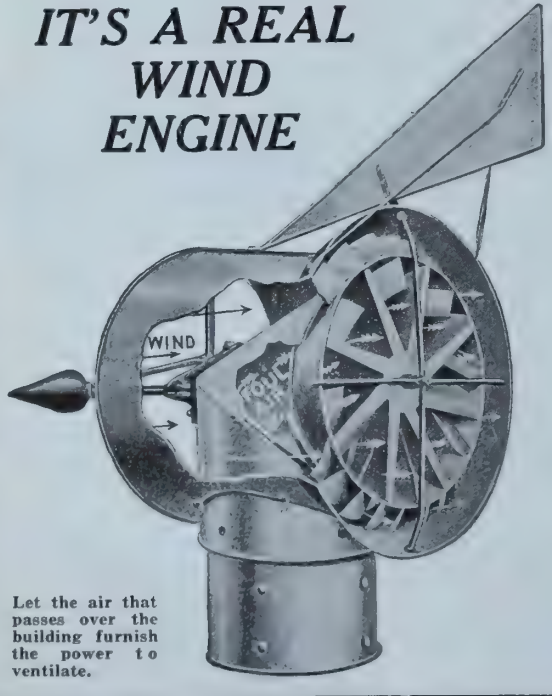
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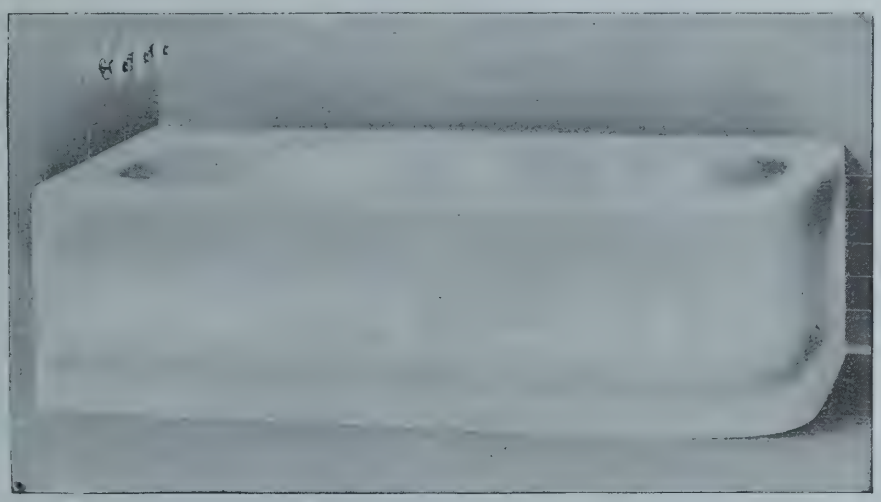
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SANITARY ENGINEER
PLUMBER AND STEAMFITTER OF CANADA

Vol. XII. TORONTO, JANUARY 1, 1918 No. 1

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Edwin Newsome, *Editor*

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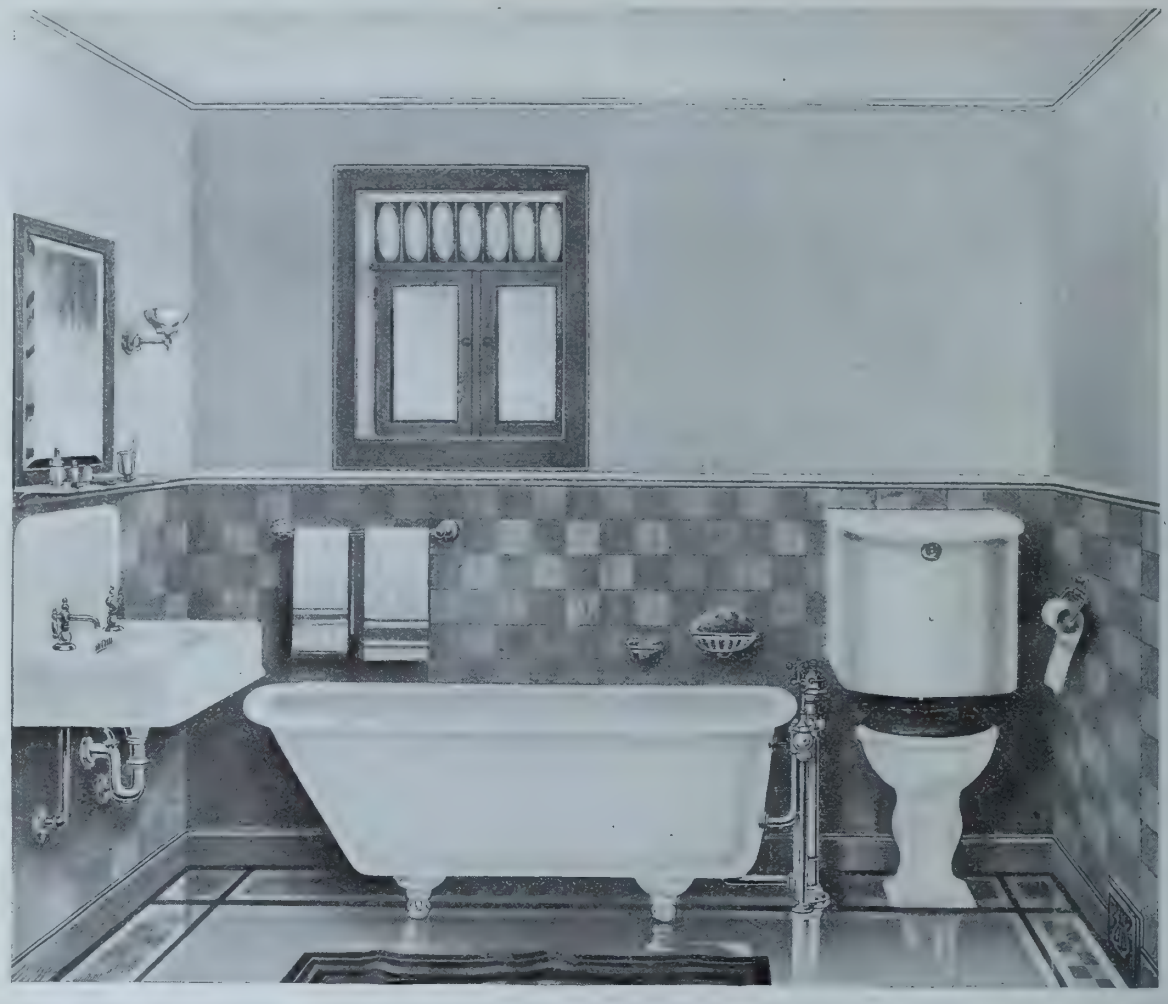
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SANITARY ENGINEER

VOL. XII JANUARY 1, 1918 No. 1

Cast Iron Soil Pipe vs. Wrought Iron

An Address Delivered Recently Before the Members of the Toronto Society of Domestic Sanitary Engineers—Some Personal Experiences Related—The Trade Should Know More About the Material They Use.

By Edwin Newsome, Editor *Sanitary Engineer.*

MR. President and Fellow-craftsmen—Some four years or so ago, when I was honored by the appointment to the position of Editor to your trade journal SANITARY ENGINEER, there were a number of matters I felt had never been thoroughly investigated. One of these was the fitness or otherwise of materials used by the trade in the various departments of sanitary and heating engineering.

These materials come under two headings, non-ferrous and ferrous; cast iron, and all other iron or steel; of course the latter is only iron specially treated or of a different analysis.

The question as to what kind of iron pipe is best for the purpose of conveying sewage, waste water or other liquid refuse from buildings is one of the most important questions we must grapple with, and from various angles, too, such as construction and longevity.

To the Canadian trade the question of using wrought iron pipe has not so far been a very prominent matter, because of the fact that in Canada its use has been in the main very exceptional. Therefore, very little thought has been given to the question, but the question has at some date to be taken in serious consideration, so why not now?

I do not believe there are more than one hundred buildings throughout the whole of Canada that have adopted what is to us known as the Durham system of plumbing, therefore we do not know very much about what is taking place in those buildings, or rather what the actual condition of the wrought iron pipe now is.

One thing I have found out, however, is, that there is no record of the pipe in question having ever been tested or inspected since it was installed, and unless such tests are made from time to time no one can say what state the wrought iron pipe is in. Of course, I am now only referring to Canadian installations.

But in the United States conditions are very different. There is not one State but what has had trouble with wrought iron soil, waste, vent, and drainage pipes.

I was travelling through a number of American cities last August and this very problem was one that took up a certain amount of my time. What did I find? In Chicago I visited several large buildings and examined the plumbing, both cast iron and wrought iron installations. I found that in every installation where wrought iron pipe or steel was in use the pipe was in a bad state of corrosion. But one of the worst cases of all was the plumbing of the City Hall, Chicago.

Mr. Thomas Claffy, the assistant chief plumbing inspector, took me round the building, and on the top of the roof I saw rust scale nearly a quarter of an inch thick. I then interviewed several other prominent men regarding their experience and one and all declared that they would not endorse the use of wrought iron pipe, no matter what kind of a coating was put on.

You have no doubt read other evidence which has been published in SANITARY ENGINEER recently regarding the conditions which prevail in the Waldorf-Astoria Hotel, New York, in which case it is estimated that it will cost in the neighborhood of $184,000 to replace the wrought iron pipe with cast iron, all because of the former piping having corroded away in many parts of the plumbing system.

The main question, however, is, shall we Canadian sanitary engineers sit back and allow wrought iron pipe manufacturers, architects, and other self-constituted persons to overrule our practical experience? Or shall we give more time to this question, investigate it, and then assert ourselves in a practical manner? Shall we instal material which our experience has proved to be unfit for certain purposes and be satisfied to sit back and lay the blame upon inexperienced men? I would say, most decidedly, no. We are the only authorities on this question if we are worthy of the responsibility placed upon us when we took this trade as the source of our livelihood.

The latest building for which wrought iron pipe has been specified is that of the new Parliament Buildings at Ottawa. The engineer in the employ of the architects has approved and specified extra heavy galvanized wrought iron pipe; and, of course, Durham screwed fittings are to be used, which also are to be galvanized.

When I learned about this. I at once took the matter up with members of the Government building committee, a body of men appointed to take the responsibility of the whole undertaking. I pointed out that the very nature of wrought iron pipe prevented it from being as reliable as cast iron pipe. I submitted all kinds of evidence to substantiate my statements, but all to no avail. I pointed out that if cast iron soil pipe and fittings be used that a saving of nearly $15,000 alone would result, and still no notice was taken, until finally I learned a certain wrought iron concern had discussed the question with the architects and tried to prove that my statements were misleading. These are a few of the points they brought out:

First, that wrought iron is a much more refined product than pure cast iron, and that the process by which wrought iron pipe was made ensured that material being the best for the purpose named; that a thin coating of slag was left on the pipe inside and out which protected the pure iron.

Now, gentlemen, what would you think of such a ridiculously misleading statement? Who ever would make such a statement to a body of practical men? It may be, and no doubt is, possible for a number of easily-led architects to swallow such a statement, but never such a body of men as are engaged in installing sanitary plumbing systems. Then to prove that extra precaution is taken to further protect the pure wrought iron pipe it was said that it is galvanized or coated with zinc, and zinc is a non-corrosive metal. Another foolish statement. Of all metals that will deteriorate when subjected to sewer gases, which consist chiefly of carbonic acid gas, CO_2, zinc is the chief. But here is another strange point in these claims: First, slag is a good non-corrosive substance, according to our wrought iron pipe friend, but he then claims to add zinc to the pipe as an extra precaution. I cannot see how this could be an extra precaution, because those who know are well aware that before wrought iron pipe can be galvanized all trace of slag must be thoroughly eliminated. It would be impossible to galvanize pipe over slag; therefore, one non-corrosive substance is destroyed, only to be replaced by another non-corrosive substance. But as a matter of fact neither slag nor zinc has ever yet been proved to be non-corrosive.

Another silly claim is next made for wrought iron pipe when used in sanitary constructions, viz., that there are fewer joints. This question has nothing whatever to do with the best kind of material to use, but we will grant that this is a point worthy of consideration. Wrought iron pipe is made in 20-foot lengths, while cast iron pipe is only made in 5-foot lengths. But it is a well known fact that under certain conditions, in spite of this, it is quite possible to have fewer joints in an installation where cast iron soil pipe and fittings are used than would be the case if wrought iron pipe were used.

For example, if in a battery of w.c.'s Durham fittings were used, each branch on the horizontal main would require a Y and nipple, so that if 12 fixtures were in the battery there would be 24 threaded joints, while for the same number of fixtures in a cast iron installation there would only be 13 joints, simply because cast iron Y's with a long caulking length can be procured.

Then, again, it would be interesting to know how many full 20-foot lengths of wrought iron pipe are installed without a fixture intervening. That old fogey story about wind strain and swaying of tall buildings is often referred to as an important piece of evidence in favor of wrought iron pipe. All this argument is only based on theory, and not practical theory at that, because every practical man knows full well that if there were sufficient swaying strain exerted on a cast iron soil pipe stack to cause a leak that same strain would unquestionably break a piece of wrought iron at the thread, or else split a fitting. And, by the way, what would be the condition of a branch joint on the horizontal? Would it not also be fractured? Again, even suppose we take it for granted that a lead caulked joint is a weak spot, and a slight leak were to develop as a result of wind stress or strain, would it not be much easier to go over a stack and recaulk it, or even re-make the joint than to have to repair a wrought iron pipe installation?

There is another final and most important piece of evidence, and that is time. Time and decay have no effect on cast iron pipe. There are cast iron pipes in use all over the world that have been doing service for hundreds of years. Thousands of buildings have been equipped with plumbing that is comprised of cast iron pipe and fittings and never an inch has been taken out through its having corroded to such an extent as to cause a leak, while there are no buildings in which wrought iron pipe, whether galvanized or coated with any other material, is as good as new after 10, 15, or 20 years.

In conclusion, then, why should we stand calmly by and instal any material that has not been tried in actual practice? Why take the risk? I do not mean that we should adhere to old practices that can be improved upon, but this is a matter of life and health. It is a case of trying to run contrary to the laws of nature, trying just how much we can get away with.

It reminds me of the story where a certain retired and invalided gentleman required a coachman; so he advertised for one, and three applicants asked for the job.

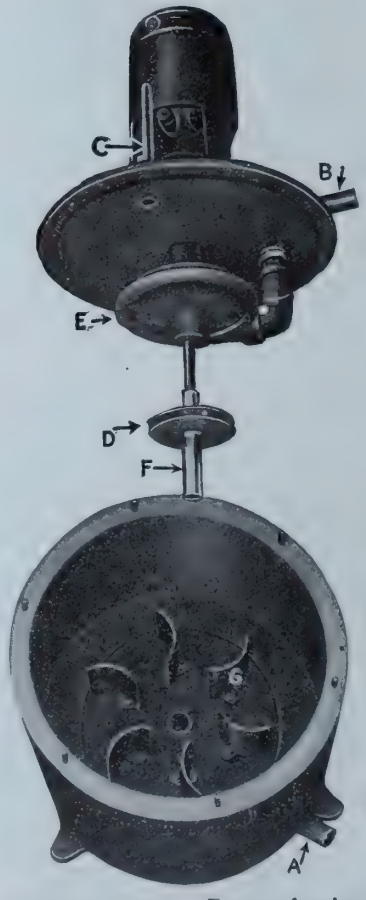
The old gentleman asked them if they were good and careful drivers. Said he: "I am very fond of taking a drive round the mountain side, and at one place there is a road running on a ridge where only one vehicle at once can travel. If the wheels were only a few inches to one side there would be the danger of being hurled over the edge of the ridge and down the mountain side." Well, one of the applicants vowed he could drive within an inch of the edge without fear of falling over. The next fellow said he would bet anything he could drive so close that one-half the tire would be projecting over the edge. The last, a big burly Irishman, said: "Well, sorr, these fellows are sure good drivers; they have me bate a moile. Devil a chance wad I be takin'. I'd be afther kapin' awhay frim the idge iv the cliff as fir as possible." "The job's yours, Pat," replied the old gentleman.

And it is the same with cast iron versus wrought iron pipe for the purpose named. Time and nature's laws have proved that cast iron soil pipe and fittings can be depended upon, whereas no wrought iron pipe of any kind has yet proved worth the risk. In conclusion, gentlemen, allow me to thank you very much for the honor of having been permitted to address such an interested audience. I am sure the pleasure has been all on my side.

New Sanitary and Heating Goods

NEW VACUUM PUMP

HERETOFORE the plunger or rotary type of pumps was used on vacuum systems where pumps were used at all but anyone having experience with this type of pump well knows that varying high and low temperatures affect more or less all working parts such as plungers, pistons, eccentrics, etc., and this being so this new pump has been put on the market. The Chicago Air Line Vacuum Pump has no wearing parts except the bearings, and these will last for a long period, when they may be replaced very quickly and at a very nominal cost.



New Chicago Vacuum Pump of unique yet very practical design.

The accompanying illustration shows the interior construction of the Chicago Air Line Vacuum Pump. The principle of operation is similar to that describing the Vacuum Return Line Pump, with the exception that no water pump is provided with this unit, as air only is handled. The return line is connected at "A." The receiver is partly filled with water. The air impeller "D" revolving in this water creates a vacuum, exhausting the air to atmosphere through opening "C" on side near top of receiver. As the creating and maintaining of a vacuum depends upon the water, a slug, or, for that matter, any amount of water, will not affect the pump in any way. Should too great a volume of water come back, it will flow from the receiver through opening on side near top of receiver without in any way impairing the efficiency of pump. When starting up the air line or return line vacuum pumps, receiver must be partly filled with water.

The air line vacuum pump may be automatically controlled by connecting to the return line an automatic vacuum regulator, which automatically starts the vacuum pump when the vacuum has dropped to a predetermined low level and stops when the maximum vacuum is reached.

Many vacuum pumps give trouble when steam is received, necessitating the introducing of cooling water. It is claimed that the principle of the Chicago Turbine Vacuum Pump is such that if steam enters the air impeller it is thoroughly mixed with the water in the receiver, which acts as a condenser and increases the efficiency of the vacuum pump.

LETTERS TO THE EDITOR

MR. SMITH REPLIES

There appear at times in the SANITARY ENGINEER as well as other papers impractical suggestions and ideas that are hardly worth while writing about but the recent letter of Mr. Murphy in the SANITARY ENGINEER on "The Relation of Air to the Deterioration of Pipe" is so brimful of impractical and foolish ideas that it is impossible to let it pass without a challenge.

In the first paragraph and near the end he says, "then it is a mistake to put too many vents on our sewers." I cannot agree with Mr. Murphy or anybody else who says you can put too many vents on sewers. We have still a good many things to learn about the ventilation of sewers, and in the light of the experience had at Moose Jaw in May, 1916, when 3 men were "gassed" in a sewer—one fatally—it behooves us to go easy in suggesting a limitation to sewer ventilation. A sewer system is much like a human system, it must have an abundance of fresh air if it is to have a long and useful career. As for the statement that "it would be also a mistake to put a fresh air breather on the house side of the main house trap," Mr. Murphy must be totally ignorant of the functions of a fresh air pipe if he does not know that one of them is to take care of compression which is almost as important as the fresh air supply. There are many cases on record, especially in buildings several stories in height, where the water in the traps of the lower fixtures has been blown out under compression when the fresh air pipe has been temporarily blocked at a time when the upper fixtures were flushed. There is no doubt that we cannot do without a fresh air pipe so long as we use a house trap. A house trap most sanitarians agree is an abomination and we only use it in Winnipeg because we have to.

The rest of Mr. Murphy's thesis where he tries to prove that eliminating air from waste and soil pipes will prevent corrosion is built up without any regard to the other functions of a plumbing and drainage system, and reminds me of the story told of the eminent surgeon who was called in to perform an operation and when relating his experiences afterward said the operation was entirely satisfactory but the patient died.

We are all agreed on the point that cast iron has a greater resistance to corrosion than wrought iron in a plumbing system, and the most sensible attitude to the question is set forth in the letter from Mr. Claffy of Chicago appearing in your issue of the 1st Nov. wherein he states that "it is perfectly practicable to use cast iron wherever the screw pipe can be used, and aside from prejudice there seems to be no other reason why cast iron should not be used more generally in plumbing systems."

On the other hand we have several jobs constructed from 8 to 12 years ago of galvanized wrought iron piping which so far show no external evidence of extensive corrosion.

In conclusion let me say that your articles on this subject have been of immense interest and value.

I am enclosing a list as requested by you some time ago of the large buildings in Winnipeg in which the plumbing systems have been constructed of both cast iron and wrought iron piping.

Your truly,
Jas. Smith,
Plumbing & Sewer Inspector.

Editor SANITARY ENGINEER,—

I CANNOT let the occasion pass without making some reply to the article by R. N. Murphy which appears in the Dec. 1 issue of SANITARY ENGINEER. There are many points brought out by him which prove that he has not quite grasped the real reason, or the why and wherefore of trap venting, as well as the need for sewer ventilation.

It would appear from Mr. Murphy's article that it is his express object, as he informs us, "to prove that it is a combination of air and dampness that causes any iron to decay" leading up to his main thesis, which is "to prove that a system of plumbing through which the air is allowed to circulate is not so good from a lasting point of view as a system with the air excluded."

This being so, it does not appear that there is any necessity for him taking up so much space with a discussion as to the relative merits of wrought and cast iron pipe nor as to the advantages or otherwise of the main house trap as at present installed allowing as it does for a more or less free circulation of air.

Concerning the former I would merely remark that it will be generally conceded that, under certain circumstances, cast iron is much more durable than wrought iron and that, while wrought iron has certain advantages, cast iron is probably the better material for soil, waste and vent pipes.

The question at issue really is as to whether it is practicable or desirable to employ a system from which air is excluded.

Now, it is obvious, in the first place, that it is impossible to entirely exclude the air as a vacuum could not be maintained in a system provided only with water sealed traps.

Further, it is clear that the discharge of fixtures, say, the flushing of w.c.'s on upper floors would create inequalities of air pressure in such a system forcing the lower fixtures and syphoning the upper ones and thus causing a renewal of the air already in the system.

It does not, then, appear that the air can be got rid of in this way and it is still there getting in its deadly work on the iron pipe not to speak of the increased liability to stoppages caused by the multiplicity of traps.

I am not, however, at the present time inclined to press these points as I wish to draw attention to a certain statement which, if true, effectually settles this question, so far, at least, as Mr. Murphy is concerned. This statement is to be found on page 24 of the Oct. 1 issue of SANITARY ENGINEER in the course of an article written by one Harry Y. Carson who claims to have had considerable experience in this matter and is as follows:—

> Wrought iron pipe is susceptible to the corrosive influence of the sewage gases, and the effect is manifest by a peculiar flaking off of rust scales on the interior of the pipe. The corrosive action takes place fastest in places where the gases have a chance to become concentrated. For instance, the lines showing the most rapid deterioration are "dead ends," or it may be that a wrought iron vent will choke up with scale and thus create "dead ends" in both the horizontal soil and vent branches.—J.G.M., Vancouver, B.C.

CANADIAN SOCIETY APPOINTS NEW SECRETARY-TREASURER

AT a meeting of the Sub-Executive of the Canadian Society of Domestic Sanitary and Heating Engineers, held on Friday evening, December 21st, in the office of President Alex. Charette, in Montreal, the following business was transacted.

Those present were Messrs. Alex. Charette, President; L. J. Conroy, Sec.-Treas.; Joseph Laurier, Provincial Vice-president for Quebec and John Watson, Chairman of Apprenticeship Committee.

The resignation of L. J. Conroy as Sec.-Treas. was received and accepted. John Watson, was appointed Sec.-Treas. in his stead, and was handed all the documents, etc., belonging to the Society, by the late Sec.-Treas. in good order. The address of our newly appointed Sec.-Treas. is 4,145 St. Catherine West, Montreal, and any communications forwarded to him will receive prompt attention.

Windsor, Ont.—Hicks & Greenan, plumbers, have dissolved, R. Hicks, continuing busines.

The manufacturer who fails to advertise is like the bashful beau who throws his best girl a silent kiss in the dark. He knows what he is doing—but nobody else does.

Air in Homes Too Dry

Some Good Selling Talks For Sanitary Engineers—Two Things Heating Systems Lack—Control of Temperature or Provision For Moisture.

THE following clipping from the "Ottawa Journal-Press" is too good to be lightly passed over. It is well worth reprinting and particularly so because of its having first appeared in a daily paper. The average daily paper is too full of fiery politics and controversial articles to be of any real value to humanity. We want home papers, papers that teach us how to live and become better citizens. We want practical men at the head of our Government departments, men that know with a capital K just what is, and is not required.

Millions of dollars are wantonly wasted by electing nonsensical lawyers and other know-nothings. And if newspapers will come down to earth, publish things really worth while, showing as the following article does that moisture in our homes is an absolute essential to our health, then people would begin to take notice.

Editor "Ottawa Journal-Press."

Sir:—During these days when it is everyone's duty to economize, both for the purpose of investing savings in the war loans and also to use the least possible amount of manufactured products and minerals, particularly coal, I think it is a proper time to introduce to the public a subject which is new to the majority and little understood by the rest.

This is the importance of keeping the air in our houses supplied with a proper amount of moisture.

In the majority of cases the air in our houses is altogether too dry during the winter months to be healthy, also a dry atmosphere requires to be heated to a much higher temperature in order to obtain the same sensation of warmth.

Let me explain. When the outside air is at zero it would be "saturated" or would contain as much water as it could hold if a little more than half a grain of water per cubic foot were contained in it.

This quantity of moisture would be scarcely noticeable if the air were heated to say 60 degrees Fahrenheit as it requires five and three-quarters of a grain of water to "saturate" 1 cubic foot of air at this temperature. So that in taking air at zero into our homes and heating it to 60 or 70 degrees it contains a good deal less moisture than is necessary. This lack of moisture is the cause of most of our winter colds, catarrh, and most other throat and nose troubles, as by breathing a too dry air the natural moisture of the nose, throat, and bronchial tubes is dried up leaving the tissues more or less inflamed and in a condition which makes them very susceptible to germs of disease.

Also the dry air causes the moisture of our bodies to evaporate which process extracts heat, causing a sensation of cold. Anyone who has been rubbed down with alcohol is familiar with the cold sensation caused by its evaporation. This same process is going on continually when the air in the house is too dry, which causes us to require a greater degree of heat with a consequent greater consumption of coal. Again, moist air is a better carrier of heat than dry air, as witness the stifling sensation of heat we feel on a warm day in early summer when the air is very moist, and still later in the summer we do not feel uncomfortably hot when the temperature is perhaps thirty degrees higher.

The opposite effect is noticeable in winter. Near the coast a temperature of 10 below freezing feels as cold as 10 below zero further inland where the air is drier.

It has been found that with sufficient moisture a temperature of 65 degrees will feel as warm as a temperature of 75 degrees with a dry air. So that in the interests of economy and health we should use more water and less coal. It is estimated that a saving of from 12 per cent. to 25 per cent. of fuel can be saved by keeping the air of our dwellings at a proper degree of moisture or humidity.

Authority states that an eight-roomed house requires at least 10 gallons of water evaporated per day in order to obtain the ideal 60 per cent. humidity. Few if any of our homes get more than a small percentage of the amount with the means at our disposal.

The average hot air furnace has a water pan which holds about one gallon of water which takes from one to three days to evaporate owing to its being placed in the coolest part of the furnace. Even then this water is more or less used in overcoming the effect of scorching which takes place when the air passes over the superheated surfaces of the furnace. Hot water heating, whilst it does not scorch the air, does not add to the humidity.

The strongest argument, however, in favor of adding moisture to the air in our homes in winter is not the great saving in fuel effected, but because it is an essential factor in promoting health.

There are many methods by which moisture may be added, the simplest of these being the placing of moist cloths or shallow dishes of water on the radiators or placing them near the registers of hot air heating.

Many excellent devices are on the market which are not excessively costly, which are more efficient, but a great improvement over normal conditions can be obtained by the above mentioned methods.

Yours respectfully,

A. WALTER ALLEN,

Assoc. R. San. Inst., R.P.C., Lecturer on Plumbing and Sanitation, Ottawa Tech. Schools.

463 Sunnyside ave., Ottawa.

CANADA BUYS U. S. TIN PLATE

According to the United States Department of Commerce imports of pig tin and palm oil, both essential in the manufacture of tin plate, show an increase for the ten months ended October 31, 1917, over the corresponding period for 1916, while exports of domestic tin plate and terne plates show a falling off. Imports of palm oil amounted to 33,703,671 pounds, against 24,976,235 pounds in 1916, and imports of pig tin were 126,125,792 pounds as compared with 121,048,537 pounds for the first ten months of 1916. Exports of tin plate up to October 31, 1917, totalled 421,137,657 pounds, compared with 433,000,173 pounds in 1916. Argentina and Canada were the largest customers for American tin plate, the former country leading for the first time in this respect.

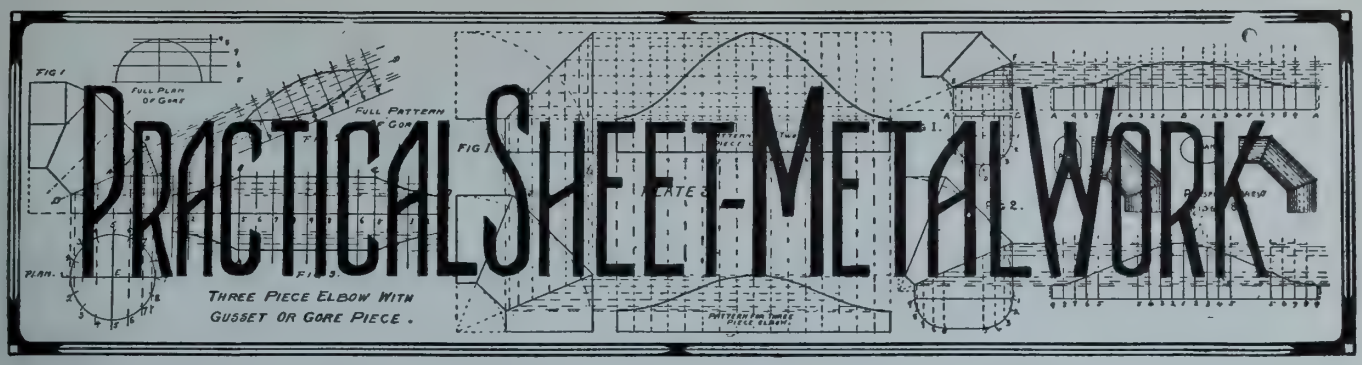
TO RECOVER SULPHUR FROM DIOXIDE FUMES

A NEW process for recovering sulphur from waste sulphur dioxide fumes is discussed in a report just issued by the United States Bureau of Mines, which says: "The results of the laboratory study of the wet Thiogen process demonstrate that the technical operation of the process can be carried out successfully for the recovery of sulphur from sulphur dioxide."

It is pointed out that the process will be of great value in the matter of conserving the supply of sulphur, especially as the supplies of pyrites imported from Europe have been curtailed since the beginning of the war.

THT FARM HOME THAT HOLDS THE BOY

A drainage inspector in a Canadian province once visited a certain farmer and found him not only in possession of a good house, with modern sanitary equipment but he and his family were enjoying the occupation of the best rooms in the house. On being asked why he did not live in the kitchen like his neighbors, and why he looked so much after the comfort of his home, he replied that he wanted to keep his boy on the farm, and that he could not expect to do so if he did not provide him with home comforts equal to those enjoyed by people of equal means and rank in the city. There is more sound philosophy in the method of that farmer than is found between the covers of many text books on rural depopulation, From *Rural Planning and Development.*



BY THOMAS STANFIELD

IN this article another type of chimney top is described, which is somewhat similar to the one which appeared in plate 24. The principle is nearly the same, and it can be used on a chimney which is situated nearer to a higher building than that upon which this top is placed.

A top of this style consists of a flat circle of heavier material than the rest of the fitting supported by a flat band of iron of sufficient strength according to size of top. A flared piece is fitted over the top of the vertical portion which conducts a passage of air through in an upward direction, and assists the draft piece of the main vertical pipe.

It will be noted that while this is termed a chimney top it is nothing more nor less than a 45 degree branch piece with a 45 degree elbow fitted to it, and a flared piece and cover placed at one end. This goes to show that in many cases the ordinary sheet metal pipe fittings can be adapted to all manner of purposes.

This fitting answers the purpose of a ventilator in many a place where almost any other type of top would fail to be of any use. Fig. 2, 3 and 4 are simply illustrations of various styles of tops, some of which have been described in previous articles.

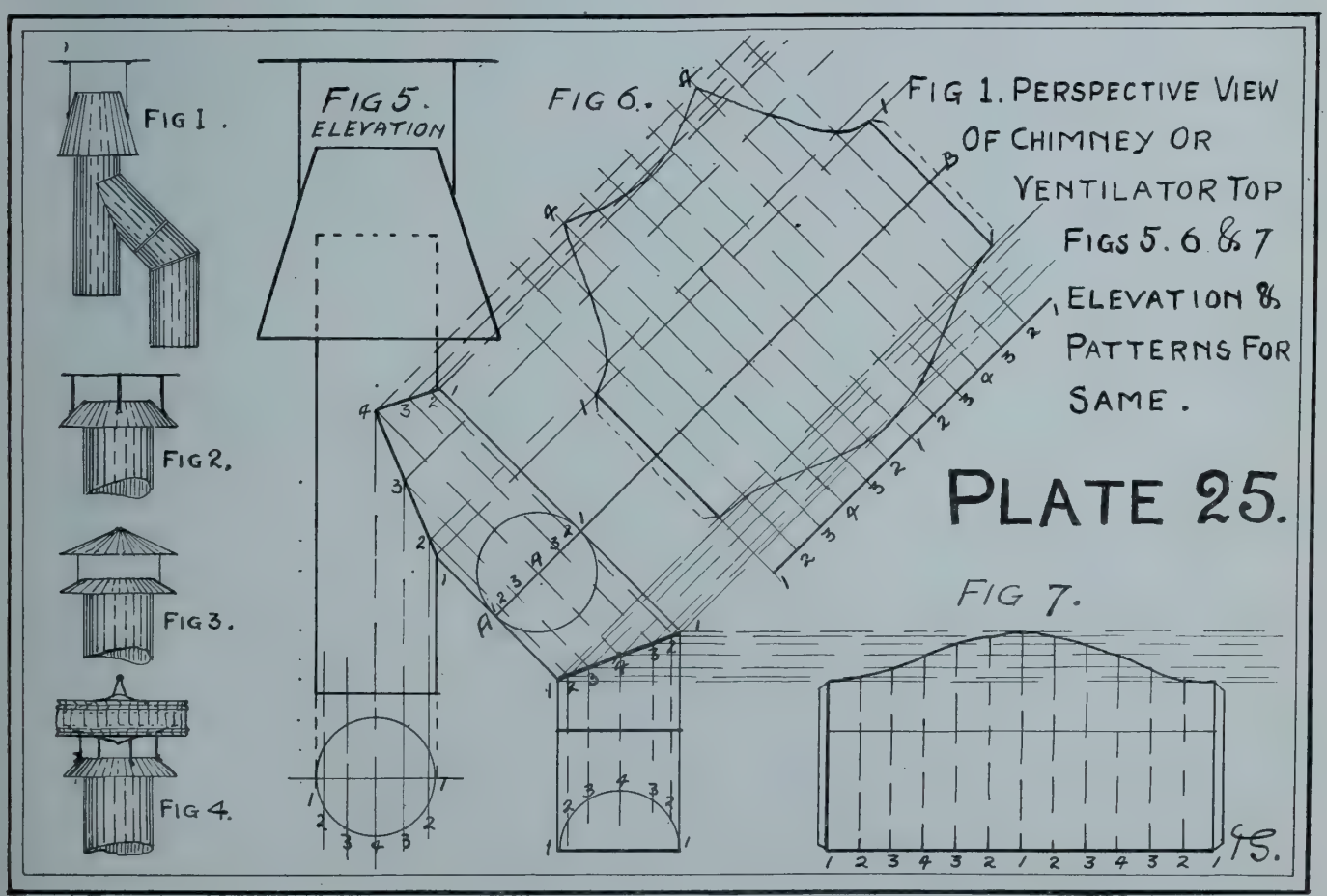
Take the one described in plate 24. The diameters of Fig. 5 must all be the same, and the centre piece should not be shorter than will allow the two vertical pipes to be one diameter apart.

First draw the elevation and plans (Fig. 5), and divide the plans into equal parts 1, 2, 3, 4, etc. Next draw dotted lines through points on plans, these lines all to be parallel with the outline in the elevation. These lines will bisect each other at various points on the mitres.

Now draw line A, B, through plan of branch and extend it so as to procure a stretchout line for pattern, next divide the stretchout line into twelve equal parts by using the measurements 1, 2, 3, 4, 3, 2, etc., and draw another set of dotted lines at right angle to this stretchout line. Next extend dotted lines from points 1, 2, 3, 4, 3, 2, 1, on branch mitre in line with the stretchout. By drawing the solid line 1, 4, 4, 1, the pattern for mitre is completed.

The pattern for the lower end of the branch piece is developed in exactly the same way as a regular one-piece 45 degree elbow as also is Fig. 7. By following out instructions given in the article accompanying plate 24, the pattern of hole necessary for the vertical piece belonging to Fig. 5 can be developed.

(Continued in next issue.)



Reports of Toronto Society D.S. & H.E.

A Review of Work Accomplished by the Sanitary, Apprenticeship and Other Committees—New Members Received and Officers Elected.

ELECTION NIGHT

THE regular monthly meeting of the Toronto Society of Domestic Sanitary and Heating Engineers was held on Wednesday, December 19th, 1917, and besides considerable business being acted upon, the election of officers and chairman of committees for 1918 took place, with the following results.

President, A. S. Purdy.

Vice-president, Thomas H. Ferguson.

Treasurer, Thomas M. Maxwell.

Secretary, Garrett F. Frankland.

Warden, William J. Hall.

Tyler, Norman Swanston.

Auditors, W. H. R. Daniels and A. H. Read.

Trustees George C. Abbott, George Clapperton, Frank R. Maxwell, George McGuire, Thomas B. Smyth, Harry G. Waterman.

Executive Committee, Kenneth B. Allison, George Clapperton, Harry A. Farthing, Fred H. Gentle, E. Lewis LeGrow, Frank R. Maxwell, Thomas B. Smyth, Harry G. Waterman, John Wright.

Messrs. George H. Cooper, Harry G. Hicks, and Thomas M. Maxwell acted as scrutineers during the election in a most capable manner, and to the satisfaction of all the candidates who aspired for office.

The officers and chairmen of committees will be installed in their respective positions at the annual meeting on the society to be held in January, on Wednesday the 16th, 1918, at which time the annual reports of the officers and chairmen of 1917 will be presented for the members' action.

The invitation of the Buffalo Master Plumbers' Association to pay them the deferred visit, arranged for in November, on January 24th, 1918, was accepted.

Mr. Harry A. Weinraub, of the Acme Plumbing and Heating Co., was initiated and introduced to the members on this occasion.

Applications for membership as received from Messrs C. J. French, and H. B. Wilcock were passed upon as favorable.

Secretary Frankland reported the receipt of quotation of eighty cents for the new style street water key, as demonstrated at the last meeting by chairman John Wright of the Sanitary Committee. Orders for same to be placed with the Secretary.

Chairman John Wright of the Sanitary Committee reported as follows:

The Domestic Sanitary and Heating Engineers in 1914 started out with the full intention of trying to change conditions in a new way of doing things by creating a Chairman of the Sanitary Committee, and giving him the full power to pick his co-workers from the Association as a whole, in order to suit conditions as they should present themselves; and up to date it has proved itself a success. For, at the end of the year, December 29, 1914, we had amended By-law No. 23, with reference to the Licensing of Plumbers to By-law No. 90, which gave us new regulations and an authorized Examining Board, of which you have already experienced the value.

In the years 1915 and 1916 we were paving the way, again leading up to something better, in amending the above By-law No. 90 to a new regulation, embodying or defining the journeymen plumbers. This was passed November 27th, 1917, and the duties of the Chief Constable are attached to same.

A provincial regulation is also under consideration by the Cabinet, for the Province of Ontario, which, if passed by the Cabinet, will have no equal.

REPORT OF CHAIRMAN OF SANITARY COMMITTEE, 1917

Toronto, December 18th, 1917.

The Toronto Society of Domestic
Sanitary and Heating Engineers

Mr. President and Members:—

At the beginning of this year, your Sanitary Committee began to try to enforce all the clauses in our plumbing by-law, and everything was going along splendidly when we had to drop it all, and put our energy to something we were not looking for just then. Some of the master plumbers have always felt that we would have to face it sooner or later: The journeymen plumbers had applied to be licensed. Now, according to the Municipal Act, which reads, "for licensing, regulating and governing plumbers," and does not classify the master from the journeyman plumber, we had nothing but the master plumber's license to give them, and that would never do. So, we took it up with the City- Solicitor. He would not classify them, and persisted in saying, "There is no difference between master and journeyman plumber." We brought all kinds of arguments to bear under the defining of regulating and governing—but he would not act. Then we applied to the Legislature, through the Attorney-General, who felt that the power lay in the hands of the Commissioner of Police, under the above words, "regulating and governing"; but he passed us on to the Government Solicitor, Mr. Wilkinson, who favored the decision of our City Solicitor. This made it look very bad for the master plumber. Then we took it back to the Legislature, to have the Act changed through a recommendation from the city council, and have it classified by the Legislature —which was not an easy job. The first thing we did was to start to define the difference between the master and the journeyman plumber. It was taken up with your committee and the journeymen, and this is the way we defined them, satisfactorily to both parties. We hope it will be satisfactory to our members as a whole, as we had to move in everything we did so quietly.

A Master Plumber is defined to be a person who is skilled in the planning, superintending, and the installation of plumbing; is familiar with the laws, rules, and regulations governing the same; has a regular place of business in the municipality, and who himself, or by journeymen plumbers in his employ, performs plumbing work.

The above definition of master plumber was drafted to protect section 70 of our City Plumbing By-law, 6388, which reads like this:—

"And all plumbing work required under this By-law shall only be done by a licensed master plumber, or by a regularly trained practical and experienced plumber in the employ of such licensed master plumber."

A Journeyman Plumber is a person other than a master plumber who has been in the employ of a master plumber for not less than one year, and desires to follow plumbing as his calling.

The above definition of a journeyman plumber was drafted to protect section 70, of our City Plumbing By-law 6388, "who must be a regularly trained, practical and experienced plumber." Who when applying to Plumbing Examining Board for a certificate for license shall present a letter of his qualifications from a licensed master plumber, in whose employ he has been working for one year, leaving it to the judgment of the Examining Board whether the applicant should be put through an examination or not.

Then we took it up with the City Solicitor again, bringing to bear the influence of our friends, having it brought on as a recommendation to the Board of Control, who in their wisdom passed same without any trouble; which in due time came before the City Council, and here is where the fun began. They could not all see eye to eye with one another, and turned it down, passing it back to the Board of Control for further consideration. This would be at about 3 o'clock in the afternoon and again, through the influence of our friends, at seven o'clock in the evening it was again reinstated and passed through the City Council without a murmur, giving the City Solicitor power to send it on to the Legislature. We feared the members would turn down this classification, and they certainly did. But after some good work, we had it reinstated, nad it got its third reading, making it an Act for the Province, which is in force now, giving the municipality the power to regulate and license master and journeymen plumbers.

We then took up the regulations of the Municipality of Toronto, to amend and license the above, which we have been successful in creating —though we did not get all we went after—but we felt that it would not be psssible under the conditions of the times; but we got a regulation which, when enforced, we think will satisfactory to everyone.

By-law No. 102
PLUMBERS

(1) "Every person desiring to carry on the trade or business of a plumber, in the City of Toronto, shall register his name and address at the office of the Plumbing Division of the Department of Public Health in the City Hall, under such rules and regulations as the said Department shall prescribe, and shall file at the said office a petition in writing giving the name of the applicant, and, in the case of a partnership, the names of each member thereof, and, in the case of an incorporated company, the name of some shareholder of the company to whom it is desired that a license should be issued, together with the place of business, and asking for a certificate that the person to whom the license is to be issued is qualified as a master plumber or a journeyman plumber.

(2) "No plumber, master plumber or journeyman plumber, who is not already licensed and recognized as in good standing with the the Department of Public Health, shall be entitled to receive the certificate referred to in the foregoing section unless he passes an examination to the satisfaction of the Medical Officer of Health (or the Chief Plumbing Inspector) and two plumbers, one a journeyman plumber of not less than ten years' experience, to be named by the Medical Officer of Health, and the chairman of the Local Board of Health.

(3) "If the applicant is found qualified by the Examining Board referred to in the foregoing section, the certificate of such qualification shall be forwarded to the office of the Issuer of Licenses for a license as a master plumber or a journeyman plumber, and such license in the case of a corporation shall be issued to the officer named on behalf of the corporation.

(4) "A partnership of two or more persons desiring to carry on the business or trade of plumbers may do so upon each member of the partnership having charge of or overseeing the plumbing work of the firm obtaining the license hereinbefore provided for, and a corporation may obtain a license on its behalf in the name of some officer thereof named in the petition for the license.

(5) "Any change in the persons composing the firm, or the officer representing a corporation, or in the location of the business, shall be promptly reported to the Chief of the Division of Plumbing and Draining, and also to the Issuer of Licenses.

(6) "No person shall carry on business as a plumber, or master plumber in the City of Toronto, unless he is the holder of a license issued as heretofore provided, is a resident of the City of Toronto, and is of the full age of twenty-one years."

DUTIES OF THE CHIEF CONSTABLE

"The following shall be the duties of the Chief Constable in connection with the provisions of this by-law:—

"(1) To prepare classified alphabetical lists of all parties who take out licenses under this by-law.

"(2) To receive and keep a register of all applications for licenses, or for transfers of licenses, to be issued under this by-law.

"(3) To ascertain that the petitions accompanying such applications are true in all particulars.

"(4) To cause an inspection to be made of all premises in connection with which a license is sought, and to make every enquiry relative to matters connected with the granting of licenses requisite to secure a due observance of the law.

"(5) To cause to be kept full particulars and duplicate counterparts of all licenses issued, and file a copy of such particulars.

"(6) To cause to be prosecuted all persons who shall offend against any of the provisions of the law or of this by-law, whenever he shall have knowledge of the same.

"(9) To make a report to the said Board of Police Commissioners of all his proceedings and transactions in the performance of his duties under this by-law once a year, and whenever else he shall be required by the said Board of Commissioners so to do."

The last meeting of the City Council, December 14th, 1917, is thus reported in the daily press:—

"By a curious omission the City Council at its meeting Friday forgot to pass a by-law making fees $10.00 and $1.00 for master and journeymen plumbers, although they passed the item in the report."

It was just as well. It stopped all arguments, and we got what we wanted. We are trying to have the License Department recompense the Examining Board, which we think they will do. Doctor Hastings would not touch it.

In 1913 there were 531 licenses issued. That was the year when anybody who applied got a license. Then, when the licenses by examination came into force, things were changed. We have up to date now, 321 licensed master plumbers, showing a falling off of 210 master plumbers in the City of Toronto.

Thanking all members for their co-operation in the part they took in the above report,

I remain,

Yours truly,

JOHN WRIGHT,
Chairman of Sanitary Committee.

REPORT OF CHAIRMAN OF SANITARY COMMITTEE

Toronto, December 20th, 1917.

Domestic Sanitary and Heating Engineers:—

During the year just closing many complaints have come in from the different members, which have been treated with great caution, and in nearly every case an agreement has been arrived at. There were over twenty complaints.

Another thing remedied was the sanitary inspectors, as sent out by the Medical Health Department, as they were causing trouble by making statements in reference to plumbing, that is contrary to the Plumbing By-law; these giving a wrong impression to the public—so that when the sanitary engineer claims certain requirements are necessary, according to the By-law, his word was doubted.

The employees of the Works Department, who go from house to house inspecting leaky plumbing, were supplying the householders with washers. That won't happen again. The inspector's job finishes at stop-cock if it is a case of water waste.

Work That Was Done

At the beginning of the year, it was thought desirable to have a new Board of Health, which would have a representative alderman out of each ward throughout the city sitting on same. This got its first reading through the Provincial House, when our worthy Mayor took it upon himself to withdraw same. We still have to discover where he obtained his power, after it had been passed upon by the City Council.

Then came our trouble with the Medical Officer of Health, who tried to transfer the Plumbing Department over to the City Architect's Department; but, as you all know, he failed in his attempt.

Then there was more trouble for the plumbers, in reference to the estimates of the different departments of the civic business. You are all aware of what took place, when Dr. Hastings again showed his feelings toward the Plumbing Department by making a statement to the Board of Control that if his estimates were cut he would have to dismiss the sanitary inspectors in the field; which he made good by notifying the chief plumbing inspector to notify all the plumbing inspectors under him, that—"it will be necessary for him to dispense with the services of all inspectors now engaged in the division of plumbing and drainage on field work."

Your sanitary committee were again on the job; for that would certainly have been a disaster if it had been carried out; not only to the plumbers, but to the public at large. In conjunction with labor, we brought weight to bear, and on April 12th Dr. Hastings was summoned to appear before the Board of Control, and was asked why Mr. Meadows had sent out the above warning to his inspectors. Dr. Hastings declared that the sanitary division of the Department of Public Health was of the least vital importance and did not bear directly on the safeguarding of human life. He meant the Plumbing Department, which is the safety valve of our homes; for in his discussion, Controller Shaw cornered him in the second question he put to him: "Isn't bad drainage more dangerous than flies?" The doctor said: "That is not the stand taken by the authorities." So, he must get the above second-handed. He failed once more to get rid of the Plumbing Department.

The Provincial Sanitary Engineer, Mr. Dallyn, drafted a Plumbing By-law for the Province of Ontario, which we were unable to approve; we thinking that it should be in the shape of a regulation giving the municipality the power to create their own Plumbing By-law to suit their own conditions.

In Clause 2, of the proposed By-law which he had drafted there was a phrase, giving the council of a municipality the power which should belong only to the Provincial Government. The clause reads like this:—

"Clause 2.—The By-law set out in these regulations shall take effect and be in force in every municipality of the Province of Ontario, from and after.....as if enacted by the council thereof, and the council of every municipality shall have authority to pass amending by-laws for making additional requirements in respect to any of the matters dealt with in these regulations, subject to the approval of the Provincial Board of Health (and every municipality may by amending by-law transfer the control of plumbing from the local Board of Health to a special department, or to the City Engineer or City Architect.)"

The offending clause, Section 2 of the Provincial regulations, has been entirely struck out of the regulations.

The provincial regulations govern sanitary conveniences, water service connections, house connections to sewers, etc., and gas-fitting.

There are 251 clauses in these regulations. They have been briefed and a copy of same has been forwarded to the Provincial Secretary, who in due time forwarded it to the Provincial Cabinet, who after discussing same sent it back to the Provincial Secretary, to lay it over for a special sitting, it being such a lengthy document.

No. 7921. A By-law

To amend By-law No. 6388 with reference to the grades of drains.

(Passed December 3rd, 1917)

The Council of the Corporation of the City of Toronto enact as follows:—

Section 12 of By-law No. 6388, being "A By-law to secure the sanitary condition of buildings," is amended by striking out the words "drain shall have a fall of not less than one-quarter of an inch to the foot" in the sixth and seventh lines thereof, and by substituting the following therefor: "no drain shall be laid with less grade than the folowing:—

Drains 4 inches in diameter, a minimum grade of 1 foot in 48 feet.

Drains 6 inches in diameter, a minimum grade of 1 foot in 48 feet.

Drains 9 inches in diameter, a minimum grade of 1 foot in 96 feet.

Drains 12 inches in diameter, a minimum grade of 1 foot in 160 feet.

Drains 15 inches in diameter, a minimum grade of 1 foot in 230 feet.

Drains 18 inches in diameter, a minimum grade of 1 foot in 300 feet.

Drains 24 inches in diameter, a minimum grade of 1 foot in 370 feet."

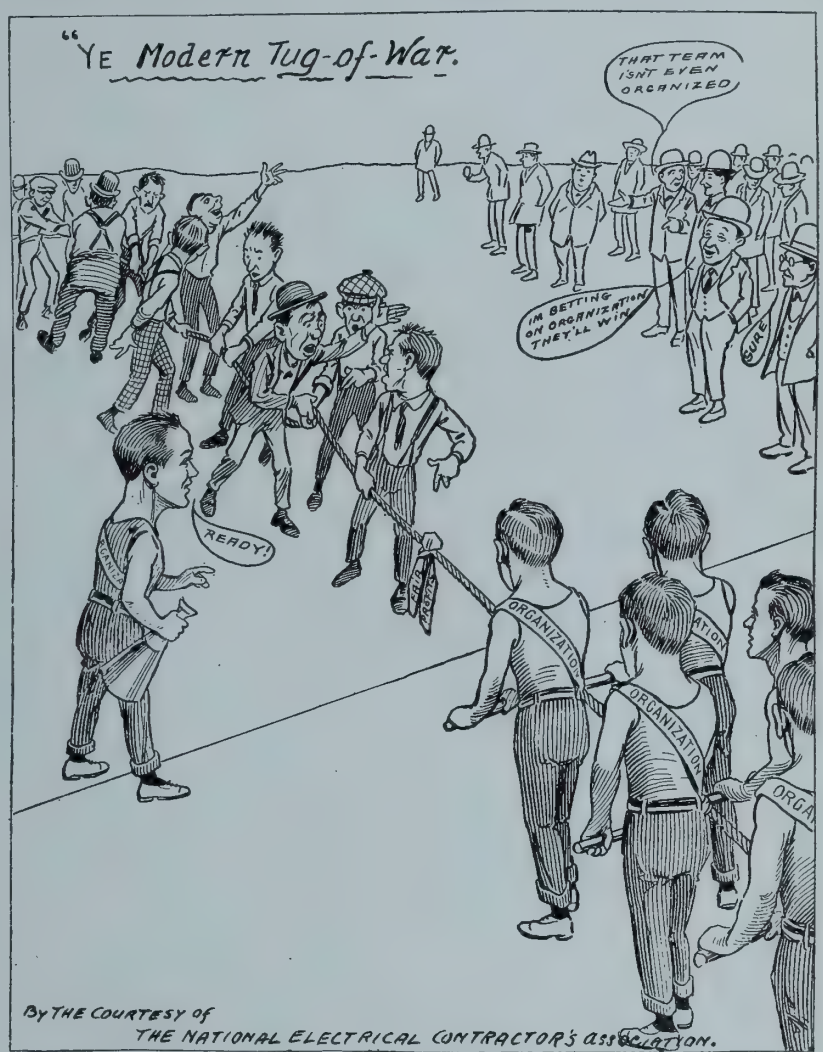
W. A. LITTLEJOHN,
City Clerk

Council Chambers,
Toronto, December 3rd, 1917.

T. L. CHURCH,
(L.S.) Mayor

Now, gentlemen, it is up to your incoming executive committee to use good judgment in electing your chairmen of Sanitary Committee, to carry the above provincial regulations to a finish.

JOHN WRIGHT,
Chairman Sanitary Committee



A very timely picture. It shows that where there is unity there is strength.

Chairman John Wright of the Apprenticeship Committee submitted a report for the Joint Examining Board of Plumbers' and Steamfitters' Apprentices:

JOINT EXAMINING BOARD OF PLUMBERS' AND STEAMFITTERS' APPRENTICES ANNUAL REPORT, 1917

Mr. President, and Members of the Craft:—

The Joint Examining Board of Plumbers' and Steamfitters' Apprentices beg to make report as follows of their stewardship of the duties placed in their care as your representatives on the above Board for 1916 and 1917.

It might not be amiss to mention here that the above board is in accordance with the terms of the agreement, as shown in Clause Six, that was mutually made and entered into between the Toronto Society of Domestic Sanitary and Heating Engineers, and Local Union 46 of the United Association of Plumbers and Steamfitters of the United States and Canada, and thereby derives its power of operation.

The first meeting of the year was held in September of 1916, at which time the procedure of the operation was decided upon, by the original members of the Board, who were as follows:—

The appointees of Local Union 46 for the steamfitters' section being Messrs. Wm. Gallaher, and Wm. F. MacKenzie, and for the plumbers' section, Messrs. Alex. J. Rattray, and Thomas Willis; while those appointed for the Toronto Society were Messrs. John Wright, and Thomas M. Maxwell for the plumbers' section, and Harry G. Waterman for the steamfitters' section.

The Board agreed that the apprentices be divided into two groups in each trade, Group Number One, being apprentices of three years' experience or thereabouts; Group Number Two, being apprentices of five years' experience or thereabouts, or when applying for journeymen's rate of wage.

Questions and answers for the above groups in each trade were compiled by the Board, and Garrett F. Frankland, who was appointed secretary for the Board.

The Board decided that those apprentices who were registered with the Board, and who had served already five years apprenticeship at the time the agreement came into force, be considered outside the jurisdiction of this Board, and eligible to become journeymen.

To date the Board have held twenty meetings, averaging one a month and in some cases two or three meetings being held a month.

Fifteen apprentices have been examined in that time, while about thirty apprentices have been registered with the Board.

Messers. Gallaher and MacKenzie, steamfitters appointed to the Board by Local Union 46, were replaced on account of leaving town in June, 1917, by Messers. J. J. Sullivan and Alex. McBain, who have acted since in their stead.

While the upset conditions that are prevailing among us at present due to the war, have not allowed of the expected activities planned for by the Board, the machinery is all prepared and ready for action when conditions resume their normal state once again.

The Board have planned to co-operate with the trade classes arranged for our trades at the Technical School, and strongly recommend to all engaged in our line of endeavor to at all times recommend to the boys engaging in our calling to take up their particular branch at the classes arranged for them in the Technical School.

Your Board feel that with the co-operation of the above classes, the efforts of our Board, and the examination of journeymen by the city, for 1918, as well as for masters in respect to licenses, will to a large extent overcome the many unsatisfactory features that have surrounded our trade in the past.

The support of each and every journeyman and master is earnestly requested to the end that all boys engaging in our trade are assisted to become first class mechanics by seeing that they are registered with your Board, who will then see that the boys are advanced along the required lines so that they may become the respected citizens of to-morrow, and bring to our craft the honor which is its due.

The Board cannot express in words its outlook for the future of our craft, but will say that if the foundation as laid by this Board is built on accordingly, it will not be long before those engaging in our calling will assume a position in the community equal unto any of the professions.

The Board wish to express their thanks to Wm. J. Storey, organizer of Local Union 46, for his assistance to the Board throughout the year in registering apprentices for examination. Also to the Toronto Society for their kindness in furnishing the Board with quarters in which to carry on their work, and their constant effort to have all apprentices registered with the Board.

In closing we would draw your attention to attached form of certificate as issued by the Board to the employer of the apprentice passing his Group One examination. Another style of certificate is handed the apprentice when he passes Group Two examination, thereby qualifying him to assume the duties of a journeyman in the respective branch of our business.

Attached as well you will find a detailed list of the apprentices who were registered, as well as those having been examined by the Board.

Trusting that our effort on your behalf meets with your approval, and thanking one and all for the confidence placed in us as members of your Joint Examining Board of Plumbers' and Steamfitters' Apprentices for the years 1916 and 1917, accompanied with a wish for your continued welfare, we remain.

Yours respectfully,

Alex. J. Rattray,
John Wright,
Thomas Willis,
Thomas M. Maxwell,
Alex. McBain,
Harry G. Waterman,
J. J. Sullivan.

JOINT EXAMINING BOARD of PLUMBERS' and STEAMFITTERS' APPRENTICES.
TORONTO.

This is to Certify that.....

Employed by.....

Having made Application for Examination as a.....

Apprentice, has passed the necessary examination, and is duly qualified to handle the tools of his Trade, having secured.....Points out of One Hundred.

EXAMINERS:

.....

Application made.....

.....

Examination made.....

.....

.....

REPORT OF REPRESENTATIVES OF THE PLUMBERS' EXAMINING BOARD

To the Officers and Members of
The Toronto Society of Domestic
Sanitary and Heating Engineers.

Gentlemen:—

Your representative on the Examining Board at the City Hall is still in harness. Latterly we have been rather quiet after a period of some activity, but the near future promises some additional work. From the nature of our work it is rather hard to define results, and show concrete action. It is a leavening influence working quietly but none the less effectively.

We have adopted a rigid policy of absolute fairness to all comers (black or white, bound or free, Jew or Gentile). The examination papers set by us are reasonable, simple and such as any man wanting to engage in our business should not object to. In the nature of our work we find many peculiar situations, but as the trade comes to understand the necessity of knowing something about the business before deciding to engage in it, they will accept the necessary examination in a spirit of fairness, and will put forth an effort to read up on necessary lines, and to better prepare themselves for more advanced information. From our experience, we have discovered that in the past years there was a tendency to keep back information from the prospective apprentice to the trade, many employers and employees not seeing the necessity of explaining and teaching the assistant all that he could easily understand, with the result that a great amount of time was lost on the apprentice, and he became disinterested in becoming a good mechanic, and in many cases good men were lost to the trade.

While unsettled conditions remain in the nation's affairs, it seems to me that our greatest endeavor should be along national lines, the conserving of time, energy, material, and everything to the advancement of the nation's good. Laws may sleep when the nation is fighting for its life.

Yours,
LEWIS LEGROW.

December 9th, 1917.

Representative E. Lewis LeGrow of the Masters on the Plumbers' Examining Board for plumbers' licenses of Toronto reported as follows:

APPRENTICES REGISTERED UP TO DEC. 15, 1917. WITH THE JOINT EXAMINING BOARD OF PLUMBERS AND STEAMFITTERS' APPRENTICES.

Registered by Bennett & Wright Co.:
Plumbers' apprentices—C. Edmunds, A. Barr, D. Freer, H. Peers, L. Doyle.
Steamfitters' apprentices — W. Annersley, R. Law, V. Clarke, C. Walker, G. Peacock, V. Devereux.
Registered by Purdy, Mansell, Ltd.:
Plumbers' apprentice—W. Miller.
Registered by W. J. McGuire, Ltd.:
Plumbers' apprentices—John Hill, G. Brown, N. Snowdon.
Steamfitters' apprentices—A. W. Yates, H. Davis.
Registered by Gentle & Travis:
Steamfitters' apprentice—C. Walkinshaw.
Registered by A. Welch & Sons:
Steamfitters' apprentice—J. Levison.
Registered by Fred Armstrong Co.:
Plumbers' apprentices—J. F. Cook, A. Jacobs.
Registered by Fiddes & Hogarth, Ltd.:
Plumbers' apprentices—G. Hewson, D. McRae, G. Reid.
Steamfitters' apprentice—C. R. Beckerson.
Registered by R. Paterson:
Plumbers' apprentice—J. Wardell.
Registered by H. G. Waterman & Co.:
Steamfitters' apprentices — T. Walker, M. Heenan.
Registered by F. R. Maxwell & Co.:
Plumbers' apprentice—J. Cowan.
Steamfitters' apprentice—H. Sutton.
Registered by Wm. Howard:
Steamfitters' apprentice—A. L. Rosser.
Registered by Keith, Ltd.:
Plumbers' apprentice—J. Bell.

APPRENTICES EXAMINED BY THE EXAMINING BOARD.

Plumbers' apprentices—Walter Miller, John Fred Cook, Angus John Jacobs, John Bell, Harold Peers, Cecil Charles Edmonds, George Brown, Norman Sawdon, James Wardell, John Cowan.

Steamfitters' apprentices — Horace Davies, Thomas Walker, Reginald A. O. Law, Vernon Wilbert Clarke, C. Walkinshaw, C. R. Beckerson.

Signed, GARRETT F. FRANKLAND,
Secretary of Joint Board.

Chairman Charles Chapman of the North Enders Club reported vast improvement of trade conditions in their district:

Toronto, Dec. 18, 1917

G. F. Frankland, Esq.,
22 College St.,
City.

Complying with your request for report on progress made by the North Enders, I beg to submit the following:—

This clubs was formed in Oct., 1916. It was composed of members of the craft in the North End of the city.

The aims were to better our conditions by

Continued on page 23.

SANITARY ENGINEER

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VOL. XII. JANUARY 1, 1918 No. 1

CHALLENGE MONTREAL PLUMBING BY-LAWS

THE following letter from "A Practical Plumber," recently appeared in the Montreal *Daily Star* in reply to a previous letter written by "Interested," concerning Montreal's plumbing by-laws:

"Sir,—In reply to 'Interested,' I wish to say that the Union Journeymen Plumbers of Montreal have tried from time to time to get in touch with the proper authority in order to bring about a practical by-law in regard to sanitary plumbing in this city, but have been turned down on all occasions. We received the by-laws of Washington and St. Louis, which are considered the best in the United States, and chose from the two a suitable by-law for this city, changes being made thereon to suit the climate; but when this was forwarded to the civic and provincial authority, it was ignored. The master plumbers in this city do not install plumbing work according to the present by-law (even if it is the worst possible.)

"The journeyman plumber when employed by a master plumber must do what his employer says, whether it be right or no, this making it hard for him to do good work. If he lodges a complaint, he is told to "Get another job," but he knows he cannot better himself because all shops are alike.

"It is simply appalling for a city like ours to have such poor by-laws.

"Re plumbing inspectors, I would say that the majority of them are not qualified for the position because they are not practical men. In some cases I have known them to be practical plumbers, but when making complaints on jobs they were told to "shut up," because the property on which they made the complaints was run by civic authority—thus making it hard for the inspector to enforce any kind of a good by-law.

"There is no back venting to any great extent on plumbing fixtures in this city, which is the greatest factor in the trade. Also, there is no water test on soil pipes, which is of the greatest importance to the health of the public, because when pipes are tested in this way it means that the plumber must do the very best of work, as it is a very severe test. This test is carried out in all of the cities of the United States and also in some of the cities of Canada in which by-laws are enforced. This test allows soil pipe to be installed properly—thus preventing sewer gases from escaping, which, of course, causes so many diseases.

"We have in our city what they call an anti-syphon, but it is a very poor syphon, because it doesn't ventilate at all, merely acts as a syphon breaker. Cities with good by-laws would not allow this anti-syphon to be used, but on the other hand call for a good practical back-venting.

"Again, we have also in this city what they call a non-syphon trap, but I never in all my experience have seen a trap which would not syphon under certain conditions, and I have worked in some of the largest cities in the United States and Canada, and every one of them calls for proper back-venting of each fixture separately.

"I should like 'Interested,' seeing that he is an enthusiast, to get other opinions, and forward same to some authority—thus helping us to get at the foundation of a good practical by-law on plumbing work in this our city of Montreal.

"PRACTICAL PLUMBER."

In the above newspaper clipping there is much food for thought. There are conditions prevailing in Montreal that should not be. But underlying the real sentiment of the letter is a deep yearning for better conditions.

Something should be done, and someone, no doubt, must make a start. The writer, who signed himself "Interested," and whose letter appeared in the Nov. 15 issue of SANITARY ENGINEER, has at least got a first hearing in the public press and now "A Practical Plumber" gets some consideration.

It is the duty of the whole trade in Montreal to take drastic action, both employers and journeymen. Such a move would have a dual effect. First the public of Montreal would be better served, and more assured of a square deal, while both employers and journeymen would soon be on better and more understandable terms.

SOME INTERESTING REPORTS

IN this issue there appears a number of very interesting reports from a number of the standing committees of the Toronto Society of Domestic Sanitary and Heating Engineers.

Every report is full of very important items which at no very future date will have a great bearing upon the trade. The work of the sanitary committee, under the able leadership of Jno. Wright, Toronto, is particularly commendable, while the report from the apprenticeship committee is very significant. If

(Continued on page 23)

Importance of Humidity to Health

Description of a Number of Humidifiers Different in Type to Those Already Dealt With—Moist Air or Water Vapor is of Greater Density—Systems Described Have Proved Their Efficiency

ARTICLE 5

IT is the purpose of this article to discuss at some length humidifying systems that depend upon the principle of forcing steam (or water vapor at a temperature of approximately 212 degrees F.) into the air; in other words, systems in which water is raised to a temperature above which it is impossible for it to exist as a liquid. For the systems heretofore described it will be remembered that evaporation at ordinary temperatures has been relied on, though this evaporation has been aided as a rule in various natural and mechanical ways.

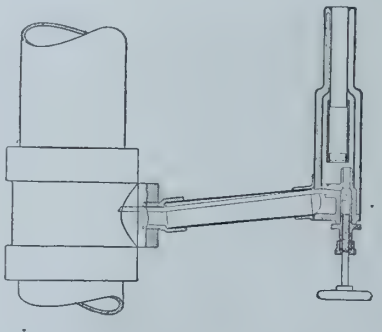
Evidently steam humidifiers are very positive in their action; there can be no doubt as to water vapor in large quantity being formed. Humidifying by means of steam also tends to increase the temperature of a room, which in the case of some factories is an objection, but seldom one in the homes located in this northern clime. Too much steam means too much humidity, with unpleasant steaming and wetting results. Such results are not found with the ordinary evaporation methods. Too much humidity is a fault, though that is seldom met with in the ordinary home, and in any event this fault errs on virtue's side.

Where steam is generated, as in the boiler of a steam heating system, an obvious but very crude method of getting moisture into the air is to bring a small (say, ½ in.) pipe from the boiler into the room to be humidified.

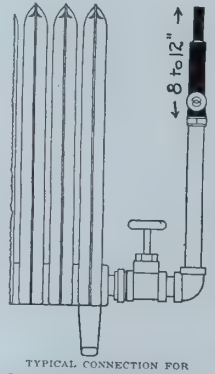
In all steam and vapor heating systems, however, provision can be made for the admission of moisture under control from the system itself. In the Doody system of vapor heating, for example, a vapor vent takes the place of the ordinary air valve. This vent is placed in a special union return fitting, which, it is claimed, ensures the radiator being fully heated before vapor is admitted into the room. Then through this vapor vent moisture passes continually into the atmosphere in an invisible jet. As the vent leaves the system open to the atmosphere from every point at all times, the possibilities of air binding, holding water in the radiator, back pressure, etc., are by the same means also obviated.

Steamo and Vapo Moisteners

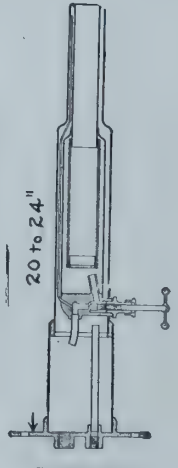
Early attempts to secure artificial humidity in homes consisted usually in placing a bowl or other dish containing water on a radiator. Following this idea, various evaporating devices were developed in tank and other forms, all of which require to be filled with water by hand, and heated by a radiator to which they are attached. This evaporating scheme has the disadvantage of absolutely inadequate capacity, being out of service when the radiator is shut off and requiring labor, care and attention in keeping filled. On the other hand, all buildings not heated by hot water or air are equipped with heating apparatus, for either steam or vapor, which is piped to every room and to every point at which it may be desirable to supply moisture. Thus a distributing system is already available, from which moisture supply may be constant with no labor or attention, as the pressure will cause it to flow continually in any desired quantity whether radiators are in use or not, provided suitable means are available for its



INTERNAL VIEW RISER TYPE
FIG. 1



TYPICAL CONNECTION FOR SINGLE PIPE TYPE FRONT VIEW
FIG 2



INTERNAL VIEW DOUBLE PIPE TYPE
FIG. 3

discharge and control. Such means must discharge steam or vapor silently in a dry state.

The above requirements are met, it is claimed, by the Steamo and Vapo air moisteners. The information that follows has been gleaned from advertising literature; the reader can best form his own conclusions as to the efficacy of the air moisteners described.

Various types and sizes are made, and except for the Radiator Type, which is made for steam only, all types may be used for both steam and vapor. The essential features of construction are the same for all types and sizes, differing only in the manner of construction.

The device consists of a silencer, through which the steam flows to the atmosphere, the amount of the flow being controlled by an adjustable valve. This silencer eliminates the noise of the escaping vapor. The chamber in which the silencer is located, together with the valve and other associated parts, is surrounded by a steam jacket which keeps these parts hot and so prevents condensation of the steam in the silencer chamber. It is in this way that the discharge of dry vapor from the moistener is assured. The steam jacket is quite independent of the air moistener itself, acting as an insulator, so all heat given to the surrounding air is from the jacket. Therefore, all condensation which takes place is on the walls of the jacket and not in the silencer chamber. If then dry steam is fed to the chamber it will pass through the silencer eliminating the noise and then escape to the atmosphere in the same dry state.

Fig. 1 illustrates the Riser Type, as it is connected to a vertical steam riser. Along the top of the stem which screws into the fitting there is a small pipe which extends well beyond the end of the stem into the riser, where there is an assurance of obtaining perfectly dry steam. This pipe terminates in the valve at the bottom of the silencer chamber, steam flowing through it, passes the valve and continues upward through a short pipe into the silencer chamber, where it surrounds the silencer, penetrating its porous walls to the central passage, by way of which it escapes to the room or apartment.

The flowing steam from its entrance through the small pipe in the riser to its final discharge to the air is protected against cooling by the jacket, which contains steam at full temperature. Even the central outlet passage to the point of exit is jacketed.

The jacket gets its supply of steam by way of the large connecting stem, which also acts as a return for the water of condensation. The steam in the jacket is, therefore, entirely independent and separate from the steam passing to the air.

The Radiator Type is exactly the same in construction as the Riser Type except as to length of connecting stem. It is necessary to carry the moistener a considerable distance from the riser, while with the Radiator Type it may be very close to the radiator. The smaller-sized Radiator Type is provided with a standard ⅛ pipe connection, which may be screwed into openings already in steam radiators, either by removing a small plug or the air valve, and screwing the

moistener in place of either. The moistener in the one case will act also as an air valve. The larger-sized Radiator Type, with ½-inch pipe connections, requires that the radiator be drilled and tapped.

While the Riser and Single Pipe Types are generally recommended in preference to the Radiator Type, there are a very large number of cases, owing to the convenience and low cost of application, where the Radiator Type may advantageously be used.

As a rule it is desirable that humidification and heating be separate so that each may be controlled independently of the other. Increasing the humidity and correcting the dry air condition results in making less heat necessary. Under these conditions if the air moistener gets its supply from a radiator, which is usually large enough to warm the apartment under dry air conditions, it is apparent that if the air is properly moistened the full capacity of the radiator can not be used without overheating. Therefore, if the moistener is attached to a radiator, shutting off the heat also interrupts the supply of moisture. To obviate the difficulty, air moisteners acting independently of the radiator have been developed.

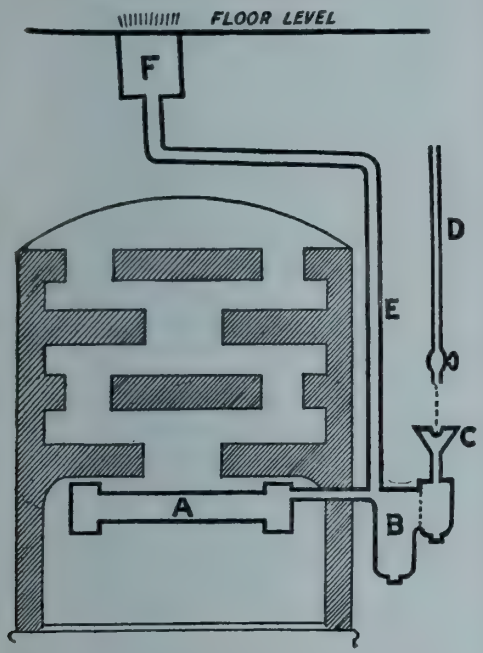


Fig. 4, showing the Hyge-Donor Humidifier installed in a furnace. This appliance can be used in any kind of furnace—steam, hot water or hot air.

The Riser Type has already been described. In many cases, especially in office buildings, vertical steam risers afford the best opportunity for attachment of a moistener, and as its stem screws directly into the riser no piping or fittings are required.

With most vapor systems, as installed in residences, the radiator is fed at the top through a graduated radiator valve by means of a vertical feed pipe. This pipe affords a very convenient and satisfactory location for the moistener just below the radiator valve. For this service a Riser Type is made with a short stem.

The screw connection of the stem for all of the Riser Type sizes is made for ⅜ and ½-inch pipe threads. In new work a tee with a ½-inch side opening would be set in the riser at a point of 3 or 4 feet above the floor where the moistener is to be located, and into which it is screwed. In old work, where it is necessary to tap the riser, the ⅜ connection, on account of its finer threads, is preferable.

The Single Pipe Type is screwed on the top of a vertical pipe, which acts as both a source of steam supply and as a path for the return of the condensation from the jacket (see Fig. 1). The action is the same as in any one-pipe heating plant, the pipe size for each being sufficient to keep the velocity of the flowing steam low enough so that the condensation may return to the source of supply. The steam inlet to the silencer chamber is taken from the bottom of the jacket below the valve, where the area is so large that the velocity of the steam to the inlet passage does not interfere with the return from the jacket.

The Single Pipe Type is made in three sizes, requiring a pipe of from ¾ to 1¼ inches. It would not be convenient or economical to employ larger pipe. Therefore, if a very large amount of moisture is required the Double Pipe Type is used. As shown in Fig. 3, the base is provided with a large chamber, which acts as a separator to prevent condensation being carried into the air moistener. Steam enters by way of the pipe connection, which extends to the top of the chamber and the condensation is taken from the bottom by a return connection. The feed and return is ⅜ inch pipe size; for the larger size ½ inch. Owing to the large size of this type it is necessary to use an electric or other fan to force a current of air across the outlet in order to insure the absorption and diffusion of the large amount of moisture discharged.

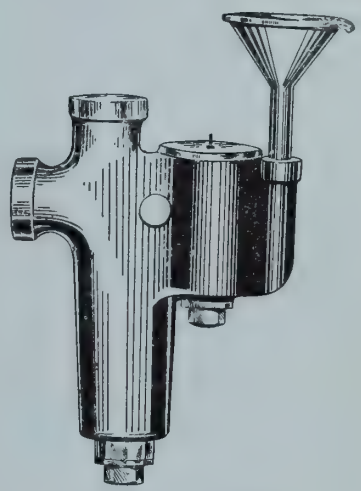
The amount of moisture discharged from the air moisteners varies with the pressure in the system. A common steam pressure for residences and apartments is three pounds. This gives a discharge from the smallest type of 2 pounds per hour, or about one quart. From the largest type there can be had 2 gallons of water per hour in the form of moisture.

If a house be heated by hot air or hot water the methods previously described in this article will evidently not be applicable. Although every hot air furnace is provided with a water pan of some sort, it is a notorious fact that the atmosphere in a house heated with hot air is as a rule drier than that found in a home in which hot water heating is installed. In both cases more humidity is greatly needed. Several different means have recently been devised and successfully put into operation.

The Hyge-Donor Humidifier

This apparatus illustrated in the accompanying figures can be attached directly to any heating furnace—hot air, hot water or steam, etc. The retort A should be so placed as to interfere as little as possible with the feeding of coal. Connected to this retort, but on the outside of the furnace, the humidifier should be placed. The water supply is fed into the humidifier at C, and, passing into retort, returns as vapor and flows through pipe E to floor grating F. The location of this grating may be anywhere on the ground floor, but preferably in the hallway, so that the moisture may most easily circulate throughout the whole building.

It is claimed that the Hyge-Donor humidifier is noiseless in operation, and is a Canadian product. After once started at the beginning of the winter and properly adjusted it requires but little further attention. It is not claimed, however, that the apparatus is automatic, as the amount of water will depend upon the way fires are kept, a slow fire necessitating a slight reduction in quantity of water passing through the humidifier.



Hyge-Donor Humidifier.

In the next article a number of humidifiers in which the water supply is automatically controlled will be considered.

"I'M SORRY; I WAS WRONG"

There may be virtue in the man
  Who's always sure he's right,
Who'll never hear another's plan
  And seeks no further light.
But I like more the chap who sings
  A somewhat different song.
Who says when he has mussed up things:
  "I'm sorry; I was wrong."

It's hard for any one to say
  That failure's due to him—
That he has lost the fight or way
  Because his lights burned dim.
It takes a man aside to throw
  The vanity that's wrong,
Confessing, "'Twas my fault, I know;
  I'm sorry; I was wrong."

And so, I figure, those who use
  This honest, manly phrase
Hate it too much their way to lose
  On many future days.
They'll keep the path and make the fight
  Because they do not long
To have to say, when they're not right:
  "I'm sorry; I was wrong."

—Des Moines Capital.

Pure Air Necessary to Life and Efficiency

The Average Life of the Printer of North America Extended From 35 to 54 Years Since 1883—Preservation of Life the Biggest Job of the Nation—MacLean Publishing Company's System the Equal of the Best Hotels

By P. O. WELL

THE filthy composing room of a past age—who would not blot the nightmare from memory?

The old-time printer was not under the influence of modern health research. Neither was the employer. They took it as a matter of course—the "white plague" was inherited from parentage, a belief possibly that it was one of the hereditary sins punishable even in the third and fourth generation. But science, which is but deduction intelligently applied, said otherwise.

The filthy, insanitary print shop of the past was not chargeable altogether to the management. Expectorating on the floors, tobacco juice and dirt, was the work of the employee. And this was strange, too, for white shirts and top hats were not uncommon garb. A famous middle-west city great daily was equally famous for the number of plug hats worn by its employees. As time went on, better and more suitable structures were erected here and there in the various cities. The employee of the composing room taxed himself to stamp out the plague of the respiratory organs, the employer was enlightened upon the loss of effort now popularly known as efficiency.

Hitting the pocket-book is the greatest incentive to remove a once-tolerated abuse, and the clean, well-lighted composing room is the result. Eternal vigilance was also necessary. In what is conceded to be one of the best newspaper edifices in the English-speaking world—by the way, a Canadian newspaper—the dressing-room allotted to the compositors was most untidy—to put it mildly. This room was as well-equipped, too, as any other dressing-room in that building. The proprietor of this newspaper furnished baths and clean towels daily. The wash-room and lavatory was not second to any first-class hotel. The persistent vigilance of the superintendent was necessary to keep this room in fit condition for its own users.

The composing room in the cellar has gone—in most cases. These as a class were not what could be called unclean. The absence of sunlight permitted dangerous germs to develop into massed growth. Lack of ventilation helped, too.

The type-setting machine came. The burnt-gas, and air robbed of its oxygen to make combustion under the metal pots, brought a new problem. Various were the schemes to draw the fumes out of the composing room. Some were worse than nothing. The wind whistled down the pipes, "froze" the metal in the machine metal pots and distributed the poisonous fumes and lead vapor efficiently throughout the room. The original poisonous gas was something else than German—so far as machine operators are aware.

The composing room of the MacLean Publishing Company, from which comes *Printer and Publisher*, is one of the newer and better composing rooms of the new modern newspaper homes. The management provided the best of ventilation. The room was well-lighted with large windows. Ventilators were placed in the roof, till the outside looked like the tops of so many Pullman cars. These helped, but did not work as efficiently as the president of the company fixed as the possibility. Other systems were examined at no little cost in travelling, investigation and time.

EDITOR'S NOTE

While this article appeared in "Printer and Publisher," and was specially written for the information of printers, there are some splendid selling talks for sanitary engineers.

Here a printer talks to printers, and the sanitary engineer who reads the article is, as it were, a silent listener to the conversation. The article just shows that progressive printers are being educated to the need of sanitary appliances and good ventilation. There is another valuable side to this article which can be more closely applied to our trade, and that is the fact that the ventilator of effective and dependable type can be used for local ventilation systems. The present method of connecting local ventilation terminals to chimneys cannot be endorsed as the best, neither can the auxiliary coil or heater be as ideal as a positive ventilator.

The time no doubt has arrived when sanitary engineers will need to give more attention to practical methods of local ventilation.

The Statler hotel chain generally employ the best devices. The ventilating system in the Buffalo hotel of this company is known as the "Bicalky" exhaust system. This system is also used by many of the big smelting companies to carry away deadly fumes and dust. So far as is known the MacLean Publishing Company is the first to instal this system in a Canadian composing room—perhaps in a composing room anywhere.

The scientific construction of the system does not depend upon any difference in temperature for its action, but a rotating fan wheel creates a vacuum and causes an upward circulation of air at all times, thus insuring positive ventilation.

The large area exposed to the moving currents of air which the double cone-shaped opening compresses and brings into contact with the outer periphery of the fan wheel, while the inside portion of the wheel connects with the foul-air duct.

The power and suction portions of the fan wheel are entirely separate, so that the two currents of air, the one driving the wheel, and the other exhausting the foul air from the building, in no way interfere with each other.

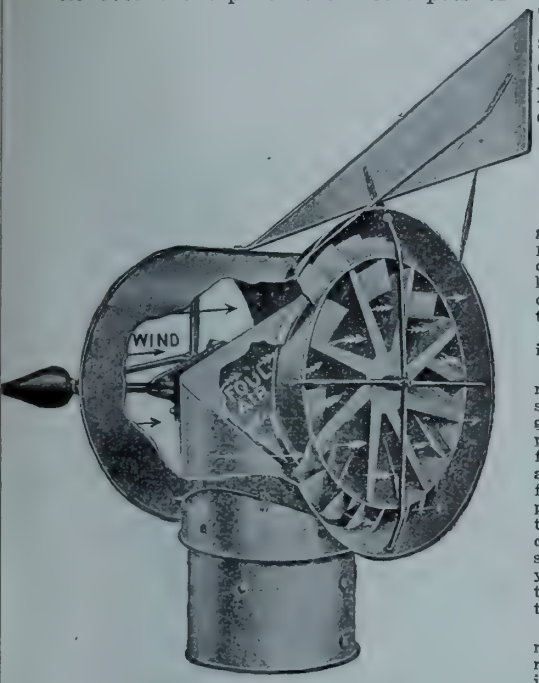
Installed on the roof of the composing room it works day and night—never sleeps—never freezes—without any attention to operating expenses other than a little oil to its ball-bearings once a year. It will work in the deadest calm as well as in howling hurricane. It is so scientifically constructed that the



Showing how the Hotel Statler ensures perfect ventilation of the rooms in that building.

rotating of this old earth upon its axis will give all the motion necessary.

The piping inside the room commences at the farthest end from the vent in a main galvanized pipe 12 inches in diameter, increasing in size to 18 inches to the upright to the roof. This main is tapped and down pipes, hoods on ends, fit over the tops of the metal pots of



Bicalky Fan referred to in this article.

the typsetting machines; and three pipes, fastened to the wall run to the floor, the vents at the bottom end of each causing a complete current of air to pass around the room.

Our associates of the composing room say that the air is pure and fresh in the morning. After being closed down for the night, composing room air is generally poisonous, as many compositors can testify.

The conserving of human life is a great duty. And it pays, and pays well, in the efficiency of the employee.

PAPER WATER PIPES HAVE BEEN SUBSTITUTED IN GERMANY

The shortage of iron and lead in Germany has led to the invention of paper pipes as conduits for water, oil and gas. Two different processes of making these are employed and they have been submitted to an extensive series of tests. In the process the tubes are made by rolling the sheets of paper around a mandrel of the desired dimensions until the required thickness is obtained, solidifying by means of a suitable adhesive and covering with a layer of a special coating.

These tubes are not appreciably affected by the prolonged action of illuminating gas, and those which were allowed to stand full of water for several weeks did not swell nor exhibit any loss of resistance. They not only weigh far less than pipes of iron or lead—in fact, only from one-sixth to one-tenth as much —but they resist three or four times as much pressure for a given thickness.

The joints are made by slipping sections of other tubes over the ends of the pipes and filling in the spaces by a suitable composition. Unfortunately, the jointed pipes burst at a much lower pressure than do the separate tubes; hence they sometimes give way at the joints. Tests of their resistance to exterior pressure give the average considered sufficient to resist the pressure of the earth provided the tubes do not gradually become soft.

REPORTS OF TORONTO SOCIETY

(Continued from page 18.)

getting a fair profit for our goods and labor, protecting ourselves against bad accounts, exchange of business ideas, and get better socially known to each other, with a view to having more confidence and closer co-operation in trade matters.

We had other aims in view, such as club buying, exchange of labor, social nights, etc.

In regard to obtaining a fair profit for our materials, this was a big question as the rule seemed to be to charge whatever price you could get, or thought you could get, the result was that practically every member had a different price for the same article. To overcome this we made a list of all the staple lines, and agreed on a fair price to charge for them. This list was put in book form and each member now charges the same price, which has saved a lot of trouble caused by customers saying they could buy the same article from another shop at half the price you were charging him, and the customers seem to like it as well as we do (perhaps we made them like it).

To overcome doing work for people who had no intention of paying for same, we had each member look over his bad accounts and bring in a list. These lists were very interesting to look at, in some cases as many as seven having the same customer on. This goes to prove that eventually the rest of us would have him if we had no safeguard.

By compiling these lists into one we have a list which we refer to when a new customer requires a job done in a hurry. If their name is on our list, we generally are too busy to do the work.

We have had quite interesting talks on business ideas. This usually takes up about 90 per cent. of our evenings, and are worth hearing. We have found out every possible trouble a sanitary or heating engineer ever had or possibly could have.

In conclusion, I wish to say while we have not got all the benefits that we could from a club of this sort, we have not done bad for beginners. But to make a complete success of it, the members in other parts of the city will have to fall in line and make it a general system. Then we can get in a position the same as proffessional men and demand the respect of the public instead of being held up to ridicule as in the past.

Trusting I have said nothing not in accordance with the rest of our members' views, I am,

Yours truly,

C. H. CHAPMAN,
CH. N. ENDERS.

The report of the Henderson Business Service Committee was received with approval, and a vote of thanks passed for the committee who submitted a most comprehensive and capable detailed statement of the numerous features desirable for the trade, as found in the Henderson Business Service, the report being referred to the Executive Committee for action thereon. The receipt of a remembrance card was announced from Corporal George Kirtley, who is stationed at Shoreham camp, in England with the Canadian Engineers, wishing the president and members of the Toronto society the season's greetings. The meeting adjourned at 11 p.m., with President Gentle wishing for the members happiness and prosperity for the coming year.

ADDRESSES SANITARY ENGINEERS' ASSOCIATION

W. R. Ingram, assistant manager of the Swift Canadian Company, recently addressed the Association of Sanitary Engineers, of Winnipeg, on the subject of cold storage. Mr. Ingram emphasized the important part cold storage and refrigeration had played in the preservation of foods, pointing out that through cold storage, food could be stored when produced in large quantities and kept until such time as there was a scarcity of the same class of foods, thus tending to maintain a low average price for such articles. Refrigeration made it possible to use certain goods all the year round when otherwise they could only be used for a few months.

Refrigeration allowed the conservation of millions of tubes of vaccine for medical purposes and it provided for extra amusement through the production of artificial ice during the summer and in hot climates. Ocean space was a most important problem at the present time and refrigeration and cold storage allowed of the carrying of much larger quantities of food than would be possible without them. Without artificial refrigeration the transportation of meats to Britain would be practically impossible.

Mr. Ingram expressed the regret that in Canada nothing was done to promote education in those sciences which were closely connected with the problems of cold storage and refrigeration.

SOME INTERESTING REPORTS

(Continued from page 19.)

we train boys properly, and in such a way as to make them respect their calling we will have done much towards earning the respect of the public. But on the other hand, if laws and by-laws are in a chaotic condition the boys coming up will wonder what need there is of learning all the pros and cons involved in the trade.

Many a splendid mechanic has wondered why he learned the trade, only to be abused by the people he was endeavoring to serve to the best of his abilities, and these conditions only came about as a result of having laws and by-laws that could be evaded by the unscrupulous.

To have arrived at a true and fair definition between a journeyman and master plumber is no small accomplishment, particularly when we consider the amount of opposition that had to be overcome.

ENTER ACTION

Stratford, Ont.—McDonald and Henry, plumbers, have entered action against A. Ackersvillers for $235 and interest, for work and material furnished.

REGISTRATIONS

Toronto, Ont.—L. Schemnitz Plumbing Company has been registered.

Montreal, Que.—E. Tremblay, plumber, etc., has been registered.

Market Conditions and Tendencies

Statements Regarding the Prices and Trend of Supplies.

THE MARKETS AT A GLANCE

INTEREST has been keen in the announcement of an increase in freight rates on Canadian railroads. This increase of 10 per cent. in the West and 15 per cent. in the East will in all probability work out toward higher prices to the consumer. Manufacturers of various commodities, such as wrought iron pipe and soil pipe, bring many of their raw materials from the United States. These freight rates will not be affected immediately as manufacturers understand there has been no arrangement respecting international freight. It is felt that it will only be a question of time until this matter is arranged between the various railway interests under the sanction of the railway commissions in Canada and the United States.

One manufacturer of soil pipe reports that considerable inquiry for soil pipe is now in evidence. It is stated this pipe is to be used in power plants and manufacturing establishments of various kinds. This is the season of the year when manufacturers expect that orders for spring delivery will be placed. It is somewhat early yet to know how the business will develop but from some quarters it would seem that already a fairly good demand is in prospect.

Transportation of raw materials and of coal and coke at the present time is a serious drawback to industry. One mill has been closed for a short time owing to the non-arrival of essential raw materials.

Ingot metals are holding in a steady market with continued firmness in the tin situation. Canadian wholesalers are apparently in a better position than dealers in the United States, as normally prices are lower there than in Canada. At the present time they are higher in the primary markets in that country than in Canada.

Price changes in plumbing lines have been few in number since last issue. This is a quiet time in the year when most concerns are busy with stock-taking.

TORONTO, Dec. 27.—Canadian manufacturers of various plumbing lines report that their requirements of pig iron have been fairly well anticipated beforehand and provision made therefor. While manufacturers in the United States have been forced to close in some instances through lack of basic materials, as yet there has been no report of restriction of trade in Canada for this reason. This is gratifying to Canadian manufacturers. Business in steam and marine lines of valves is still good but business in regular plumbing lines is somewhat light. Concerns are turning their attention to going over the amount of their stock.

Embargo On Heavy Sheets Maintained

RANGE BOILERS.—There is no indication as yet that the manufacturers of range boilers will be able to secure the heavier sheets formerly used in the ends of range boilers. Demand at this season of the year is not heavy but manufacturers are beginning to anticipate what they will have to do in order to look after the needs of the trade for spring delivery. At the present the only alternative seems to be some method of reinforcing the lighter sheets. How this can be accomplished remains to be worked out. The market for range boilers was quiet with prices unchanged.

	Standard	Extra Heavy
30-gallon range boilers....	$13.00	$17.00
35-gallon	17.00	20.50
40-gallon	20.50	24.00
52-gallon	28.00	32.00

Enamelware Holds In Steady Position

ENAMELWARE.—There was a steadiness in the market for enamelware during the time since last issue and prices held unchanged. Demand is light at the present time and it is a little early yet for manufacturers to form any opinion as to how the trade is likely to develop for next spring. In the course of another month in all probability something more tangible in the line of contemplated buildings may be forthcoming.

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Sinks, roll rim, 18 x 30 in., staple.....	16 80
Closets, oak tank and seat	22 00
Do., enamel iron or white vitro tank...	23 75

Transportation Is Affecting Supply

WROUGHT PIPE.—Manufacturers of wrought iron pipe are finding that their operations have been much restricted during the past week or ten days through the failure of raw materials to arrive. The transportation problem in the United States is given as the reason for this condition. One plant was even compelled to cease operations for a short time owing to the lack of raw materials. While new business is not brisk there is a good demand for pipe on account of existing contracts. With the restriction of raw material supplies, mills have been kept busy supplying the requirements of the trade on these contracts. Prices held unchanged.

Placing Orders Expected Soon

SOIL PIPE, FITTINGS.—One manufacturer of soil pipe and fittings reports that his receipts of raw materials during the past two or three weeks has been almost in normal volume. This is an experience directly opposite to that of some of the manufacturers of wrought iron pipe. The reason assigned for the more plentiful supply of soil pipe materials is the cessation of buying which has given the producers an opportunity to catch up with their orders. Manufacturers state that starting at the present time they expect that orders for spring delivery will continue to come in, as this is the usual season for placing of business. One manufacturer reports that inquiries for soil pipe have been quite numerous for this time of year. Prices held stationary during the week.

SOIL PIPE FITTINGS.

Medium and extra heavy soil pipe, 6-inch and under	35%	2½%
8-inch soil pipe	....	30%
Medium and extra heavy fittings, and under	40%	2½%

C. I. PIPE FITTINGS.

Cast iron fittings	....	15%
Cast elbows, tees, etc.	....	15%
Plugs	....	30%
Bushings	30%	33%
Flange unions, standard	....	20%
Dart unions, ¼-inch to 2-inch.....	20%	25%
Do., 4½ in. and larger	....	15%
Nipples, up to 4-inch	....	45%
Do., 4½-inch and larger	....	40%
Do., running thread 4-in. and under	....	25%
Couplings, 4-in. and under	....	35%
Do., 4½ in. and larger	....	15%

MALLEABLE FITTINGS.

	Black	Galv.
Malleable Fittings, Class A, lb.....	0 50	0 63
Do., Class B, lb. net.....	0 22	0 33
Do., Class C, lb. net.....	0 15	0 22

Steam Valves And Marine Demand Active

VALVES.—Manufacturers of valves

continue to give optimistic reports of the demand for steam valves to be used in industrial plants and in marine work. This is a branch of the plumbing business which has maintained steady activity for months past. With the impetus to shipbuilding that has been given through the necessity of making good the losses by submarines there is every possibility that this branch of the business will continue to be very active. Prices held unchanged during the time since last issue.

	Discount off list
Ground work	50
Compression work, standard	52
High grade	45
Cushion work	46
Fuller work, standard	50
High grade	43
Basin cocks, No. 0 standard	46
Nos. 1 and 2	46
Bath cocks	53
Flatway stop and waste cocks, standard.	53
High grade	50
Roundway stop and waste cocks, standard	53
High grade	50
Brass steam cocks, standard	Net
Globe, angle and check valves, standard.	10
High grade	7½
Radiator valves, standard	15
High grade	10
Patent quick opening valves	35
Basin Cocks—	
No. 0 and 1, Fuller pattern	50
No. 0 and 1, compression	46
Midget	50
Globe, angle and check valves, medium pressure	30
Radiator valves, standard	30
Radiator valves, Jenkins disc	30
Radiator valves, quick opening	40

Oakum Market Is In Quiet Condition

OAKUM.—There is a quietness in the market for oakum at this season of the year. There is very little soil pipe moving at the present time and the movement of oakum is usually coincident with activity in this class of pipe, particularly so on plumbers' oakum. Prices held unchanged.

		Per 100 lbs.
Best American	....	$21.50
U.S. Navy unspun	....	20.75
Plumbers' spun	$8.50	10.00

Further Settling Of Prices On Sheets

SHEETS, PLATES.—There has been a further settling to lower levels on certain gauges of black steel sheets. One concern reduced the price of gauges Nos. 20 to 28 to the extent of 50c per hundred pounds. In the instance in question No. 28 gauge is now quoted at $8.50, No. 26 gauge at $8.40, Nos. 22 to 24 gauge at $8.35 and Nos. 18 to 20 gauge at $8.30. In one quarter there was a further reduction in the price of galvanized sheets to the extent of 30c per hundred, which is indicated in the low quotations given hereunder. Following table gives the range of prices on black and galvanized sheets. As will be noted there is a wide range between high and low.

		Per 100 lbs.	
BLACK SHEETS—			
10 gauge	$	$12 00	$12 00
12 gauge	7 55	11 60	11 60
14 gauge	7 45	9 90	11 65
16 gauge	7 50	10 00	11 75
18-20 gauge	7 30	8 30	10 80
22-24 gauge	7 35	8 35	10 85
26 gauge	7 40	8 40	10 90
28 gauge	7 50	8 50	11 00
3-16-inch plate	12 25	....	.....
¼-inch boiler plate	12 00	....	.....
GALVANIZED SHEETS—			
10¾ oz.	$ 9 50	$10 00	$12 00
U.S. 28	9 20	9 70	11 70
U.S. 26	8 90	9 40	11 40
22 and 24	8 75	9 25	11 25
18 and 20	8 60	9 10	11 10
16	8 45	8 95	10 95
14	8 35	8 85	10 85

Fuel Situation May Affect Corrugated Sheets

CORRUGATED SHEETS.—Dealers in some instances incline to the belief that ere spring comes around there will be a much firmer situation in corrugated sheets owing to the fuel situation. Mills are not able to operate to capacity in the production of sheets due to the shortage of fuel supplies. This is having an effect toward a firmness in cost. One manufacturer of eavetrough and conductor pipe will book into the future for only three months and on corrugated sheets will book no further into the future than six months. Firm quotations are made on the basis of delivery at a certain specified time.

WROUGHT IRON PIPE PRICES

Effective July 5, 1917.

Standard Buttweld.

	Black	Galvanized
	Per 100 feet	
⅛ in.	$ 5 00	$ 6 50
¼ in.	5 12	7 16
⅜ in.	5 12	7 16
½ in.	6 46	8 03
¾ in.	8 17	10 29
1 in.	12 07	15 22
1¼ in.	16 33	20 59
1½ in.	19 53	24 61
2 in.	26 27	33 12
2½ in.	42 12	52 94
3 in.	55 08	69 94
3½ in.	69 92	86 94
4 in.	82 84	103 00

Standard Lapweld.

2 in.	29 23	35 71
2½ in.	43 88	54 11
3 in.	57 38	70 76
3½ in.	71 76	89 70
4 in.	85 02	106 28
4½ in.	96 52	121 29
5 in.	112 50	141 34
6 in.	145 90	183 36
7 in.	190 40	238 00
8L in.	200 00	250 00
8 in.	230 40	288 00
9 in.	276 00	345 00
10L in.	256 00	320 00
10 in.	329 60	412 00

WROUGHT NIPPLES.

4" and under, 45%.
4" and under, running thread, 25%.
4½" and larger, 40%.

STANDARD COUPLINGS.

4" and under, 35%.
4½" and larger, 15%.

Prices—Ontario, Quebec, Maritime Provinces.

	Galvanized	Painted
TORONTO—	Per 100 Sq. Feet	
No. 28 gauge	$ 8 70-$ 9 00	$8 00
No. 26 gauge	9 60- 10 00	9 25
No. 24 gauge	15 00-	12 00
No. 22 gauge	18 00-	15 25
No. 20 gauge	21 00-	18 50
No. 18 gauge	27 00-	24 00

Discount 7½%.

Boiler Tubes May Be Serious Problem

BOILER TUBES.—There is no change for the better in the boiler tube situation. Wholesalers assert that it is becoming more and more a serious problem for the users of steam. Since they are unable to get further supplies for domestic use it would seem to be approaching the time when they may have to close their plants or change to some other form of power. Once a boiler is out of commission there seems small chance of getting it repaired. Prices are unchanged for any available stocks still extant.

1	inch	$36 00	$ ....
1¼	inch	40 00	....
1½	inch	43 00	36 00
1¾	inch	43 00	36 00
2	inch	50 00	36 00
2¼	inch	53 00	38 50
2½	inch	55 00	42 00
3	inch	64 00	50 00
3¼	inch	....	58 00
3½	inch	77 00	60 00
4	inch	90 00	75 00

Lead And Zinc Products Hold Steady

LEAD AND ZINC PRODUCTS.—There was a steadiness in the market for lead and zinc products during the week. Tin is holding at high levels with little chance of easier conditions in the near future. This is having a firm effect on solder. Trade during the week has been seasonably good. Prices hold unchanged.

Lead pipe, lb.	0 14	....
Lead waste pipe, lb.	0 15	....
Lead traps and bends	Net list	
Lead wool, lb.	0 16	
Lead sheets, 3 to 3½ lbs. sq. ft., lb.	0 13¼	
Lead sheets, 4 to 8 lbs. sq. ft.	0 12¼	0 14

Cut sheets, ¾c lb. extra, and cut sheets to size, 1c lb. extra.

	Per 100 lbs.	
Solder, guaranteed	42 50	.....
Solder, strictly	39 50	39 85
Solder, commercial	36 25	.....
Solder, wiping	34 80	38 50
Solder, wire, lb.	0 45	....
Zinc sheets, per lb.	0 26	....

Snow Interfering With Old Materials

OLD MATERIALS.—There is a dullness in the old material market at present due to in large measure to the fact that snow has covered the scrap materials and sellers have shown no disposition to move them. There is very little buying on the part of mills as they are ready to take quantities only when the buying appears exceptionally favorable. Prices for all old materials held in a steady market.

Tea lead	$ 0 04½	....
Heavy lead pipe	0 06	....
Yellow brass	0 12	0 13
Red brass	0 20	....
Light brass	0 09	....
Heavy zinc	0 05½	0 06
Heavy copper	0 20	0 21
Stove plate, per ton	17 00	18 00

Ingot Metals Hold Steady During Week

INGOT METALS.—There was a quiet market throughout in ingot metals during the week coincident to the holiday period. Industrial concerns are now busy with stock-taking, and are not interested in taking in any additional supplies except for those that suffice for their absolute needs. After the turn of the year there will in all probability be greater activity as a result of the need to replenish stocks.

COPPER.—It is now quite generally felt that the United States Government will make no change in the price of copper after the new year. The copper situation might now be termed a com-

(Continued on page 30.)



PUMPS FOR WINDSOR SYSTEM

The Windsor Water Commissioners have decided to instal at once two powerful electrical pumps in order to preclude the possibility of danger through a fuel shortage. It is proposed to keep the present steam installation for auxiliary purposes.

ANNUAL MEETING OF C. T. A.

The Dominion Commercial Travellers' Association held its 42nd annual meeting in the Windsor Hotel, Montreal, recently. It was reported that the membership of the Association had grown to 8,335 and the financial surplus to $44,234. The following officers were elected for the ensuing year: Pres. Romeo Brosseau; first vice-president J. P. Harrison; second, C. J. Shea; treasurer, Maxwell Murdock.

DEATH OF J. B. FITZSIMONS

James Biggs Fitzsimons, formerly senior partner of the firm of Keith & Fitzsimons, Toronto, died recently at his home 94 Summerhill Ave., Toronto. Born in Dublin, Ireland, the late Mr. Fitzsimons came to Toronto at the age of 12 years. Three years later he entered the firm of Thompson & Keith Company and later became senior partner of the firm of Keith & Fitzsimons, retiring from active business about five years ago.

A NOVEL COMPETITION

It is not very often that sanitary engineers are paid for their advice or suggestions. They generally have to spend good time and money in taking big chances with very little likelihood of any recompense.

But here is a proposition that will pay, and spare time only needs to be taken up. The Canada Metal Company, Toronto, are manufacturing a new laundry tub. They are out to procure the best name for it and are willing to pay well. They want the best three names and will award each of the three readers of SANITARY ENGINEER who send in the best three names, one name from each competitor, a fifty dollar bond.

This competition looks better than 9 out of 10 $500 contracts, because you only devote spare time, and only have to supply "thinking caps" material, no solder, no bibbs, not even any sheet lead or lead pipe. All the same we think it is a real good chance, particularly when we realize that only plumbers, or master plumbers are allowed to compete, further whoever wins these three Victory bonds may go to some good photographer, have their pictures taken, send the proof to the editor, along with the bill for same. This will enable these three winners to have their pictures in the only plumbing paper published in Canada.

THREATEN DAMAGE ACTION

Guelph, Ont.—The inadequacy of the Guelph sewerage plant is again the main feature of the Board of Health report of Guelph Township which complains that although the city has given its promise many times to put it in good shape, practically nothing has been done. The township threatens a damage action against the city.

TENDERS

Winnipeg, Man.—Tenders have been called for construction of pressure pipe line and manufacture and supply of 48-inch pre-moulded reinforced concrete pressure pipe for the Greater Winnipeg Water District, 501 Tribune Building.

WORKS CONTEMPLATED

Pictou, N.S.—Town Council contemplate the construction of sewers on Water, Front, and Church Streets at a cost of $60,000.

Barrie, Ont.—The Town Council contemplate the construction of sewers on Mary Street, between Sophia and Wellington Streets, and Holgate Street, from the Western House to William Street.

Delta, B.C.—Town Council contemplate drainage system, costing $18,000.

PERSONAL

Col. Robt. S. Low, whose name is so well known in connection with the construction of Canada's military camps, has been appointed chairman of the Reconstruction and Repair Committee at Halifax, which is to have charge of the construction and repair work in the devastated city. Mr. Hamilton Lindsay has been appointed assistant manager.



The only public comfort station in London, Ontario. It is situated in the Market Square, hidden away where no one can see it except casual passers-by, or on market days. It is fairly well patronized, and is modern in almost every detail. Ladies' entrance is from the round tower corner and is above ground. Gents' entrances, of which there are two, are shown in the front.

TO LAY TRUNK MAIN

The municipal corporation of the Township of York has been empowered to authorize the construction, maintenance and operation of a main or water pipe to be used as a trunk main and a service pipe in Rogers road, Lambton avenue and Dufferin St., Township of York.

MAINTAIN PUBLIC BATHS

Winnipeg, Man.—Both the public baths and the comfort stations department were well within their respective estimates during the month of October according to reports submitted to the Board of Control. The estimates for the public baths amounted to $171 for the month and the actual expenditure figures at $130. Up to date the estimates were $18,211 and the actual money spent only $10,817.

MUNICIPAL NOTES

Galt, Ont.—A by-law to provide money for extensions to the waterworks system, costing $18,558, will be submitted to the ratepayers on January 1.

Alliston, Ont.—A by-law to authorize an expenditure of $6,000 to electrify the municipal pumping plant will be submitted to the ratepayers on January 7.

North Vancouver.—The district of North Vancouver Council has passed a resolution authorizing the clerk to prepare a general loan by-law to provide the sum of $35,000 for waterworks purposes. The money, in the event of this by-law passing at the general elections in January, is intended for the establishment of a waterworks system east of Seymour River. The principal need for such a system is to provide a steady and sure supply to the two large industries at Roche Point—the Canadian Robert Dollar Co. and the Vancouver Cedar Mills, Ltd.

NOVEMBER REPORT FROM THE WINNIPEG PLUMBING DIVISION

Permits issued: 76

Inspections

Water Tests	Smoke Tests	Subsequent Inspections	Miscellaneous Inspections	Defects Rectified
55	159	243	48	184

Contraventions

One case was instituted against a man for doing plumbing work without license and he was fined $5.00 and costs, amounting to $7.35

Sewer Division

Permits issued	Connections constructed	Inspections
10	14	84

Flushings

Gallons Tank Flushings	Gallons Hose Flushings	Total Gallons of Water
1,271,296	781,250	2,052,546

CONTRACTS AWARDED

Sydney, N.S.—H. G. Hagen & Co., 452 George Street, have the plumbing and heating contracts for $6,000 warehouse for J. E. Burchell Company, Ltd., 209 Charlotte Street.

Toronto, Ont.—A. Welch & Son, 304 Queen Street W., have the plumbing and heating contracts for $25,000 store and hall for Woolworth's, Ltd., Yonge and Queen Streets.

The Pas, Man.—The North-west Lumber and Supply Company, Eighth and Ottawa Streets, Regina, have the general contract for sewer lift for the Town Council.

Vancouver, B.C.—Evans, Coleman & Evans, Ltd., Fort Columbia, have the contract for cement, steel, and brick for $35,000 sewer to be constructed in Tenth Avenue by the Vancouver and Districts Joint Sewerage and Drainage Board.

Westmount, Que.—John A. Gordon, 301 St. Antoine Street, has plumbing and heating contract for $6,000 waiting room for the City Council.

Toronto, Ont.—Bennett & Wright Company, 72 Queen Street E., have sewerage and drainage contract for the Union Station, erected for the Toronto Terminal Railway Company, 36 King Street E.

Toronto, Ont.—Purdy, Mansell, Toronto, have the heating and plumbing contract, valued at $21,998, for Alexandra School Annex. Johnston Temperature Company has contract for heat regulators, valued at $1,183.



UNCLE SAM: "Give me a business man for a business job."
—Forbes' Magazine.

NEW OUTLET SEWER

St. Catharines, Ont.—William P. Near, engineer, has been authorized to purchase sand, brick, and cement for relief and outlet sewer, to cost $70,000, to be constructed on Carlton Street by the City Council.

PROCURED NICE CONTRACT

We understand too that the above concern have secured a nice contract from the Libby Packing Company, Chatham, to instal the plumbing and heating equipment in their new plant in that city.

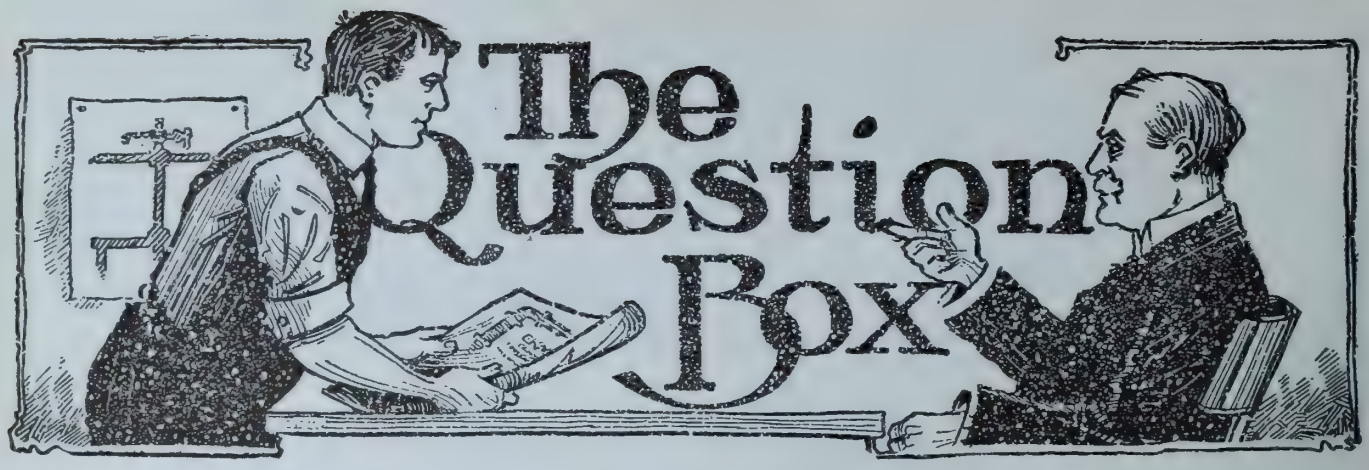
EQUALIZING BIDS

To get truly competitive bids when inviting proposals for sewers of different materials on the same streets a city in the Central West took the friction factor into account. Thus brick sewers were specified to be larger than concrete sewers, the difference in diameter generally being three inches.

CHANGE OF ADDRESS

Messrs. Sheppard & Abbott, Toronto, have changed their address and are now doing business at Harbord street, corner of Major and Harbord.

The Chicago Flexible Co. of Chicago, have now moved into their new factory, and desire the readers of SANITARY ENGINEER to address all communications to 12th Street and Central Avenue, Chicago.



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

STEEL CHIMNEY TROUBLES

By T. J.

CHIMNEYS built up of steel plates require protection both inside and outside, if they are to have reasonably long life and perform their work properly. The outside of a chimney is exposed to the action of sun, wind and rain, and the approved method of protecting it from rust is to give it a coat of good paint, which should be renewed whenever and wherever it shows signs of peeling off and exposing the metal to the influence of the elements. On the inside the chimney is exposed to the action of the gaseous products of combustion, which may have a temperature of several hundred degrees. Any form of paint would, therefore, be quite useless. Besides it must be remembered that the gases which flow up the chimney are derived from the combustion of fuels containing carbon, hydrogen, and sulphur, and, therefore, contain carbon dioxide, steam and sulphur dioxide. The steam in the chimney gases will condense if cooling takes place to any great extent, and the moisture will combine with the dioxides of carbon and sulphur to form carbonic acid and sulphurous acid. Both of these acids are corrosive in their action on iron, and they are particularly active in the presence of heat. Therefore, the inside of the chimney needs to be well protected.

The usual method of protecting the interior of a steel chimney is to line it with brick, which is laid up against the wall of the chimney. It is advisable to fill the interstices between the lining with a grout made of cement, as this will not only give support to the brickwork, but will at the same time prevent the corrosive acids from reaching the shell. Such a lining should extend to the top of the chimney to be effective. If it is carried up only half-way or even to two-thirds of the full height of the chimney the corrosion is localized at the part of the structure that it is most difficult to reach. The formation of moisture, due to condensation of vapor in the flue gases, will occur in the upper part of the chimney rather than in the lower, because the gases grow colder as they ascend, due to radiation from the shell of the chimney. It is, therefore, very advisable to carry the lining all the way up to the top.

It will be found upon observing steel chimneys that are in service that the signs of discoloration and corrosion on the outside are largely confined to the upper half of the structure. The rings or sections composing the chimney are put together in such a way that each overlaps on the outside of the ring below it, so that the edges of the circumferential seams face downward outside. This construction prevents rain and snow from collecting on the edges of the plates outside. On the inside, however, the edges face upwards, and if moisture is formed it will lodge on these edges, find its way through the joint and run down outside, streaking and discoloring the chimney. A continuous lining from the top to the bottom will lessen the radiation loss, reduce and perhaps eliminate condensation and in any case eliminate the moisture from the edge of the plates.

A FUSIBLE PLUG FOR BOILERS

By James E. Noble.

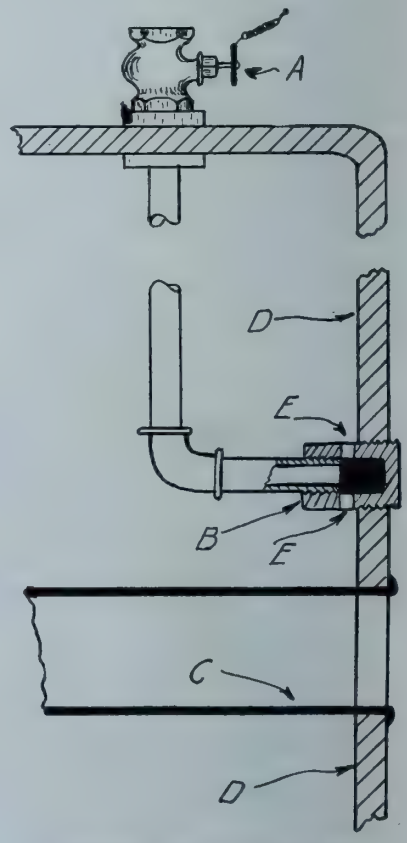
WHEN given reasonable attention the fusible plug is an important safety device. When the filling becomes covered with scale its usefulness as a safety device is nil; therefore, it should be cleaned off frequently.

Banca tin makes a reliable filler, but no filler will remain in its virgin condition very long when installed in a working steam boiler. It should be refilled with fresh tin about twice a year.

When careless attendants are in charge the fusible plug is apt to be neglected and its usefulness destroyed, but if it is in anything like fair condition it will protect the boiler from the carelessness of an attendant who may allow the water to reach a dangerously low level. The attention of the operator will be directed to the racket kicked up by the escaping steam and the necessity of emptying the boiler to instal another plug.

The manager, chief, or owner should personally see that a proper filling is put in, for many cases are on record where the attendant has refilled a plug with an iron core instead of a tin one.

On return tubular boilers the plug is usually placed two or three inches above the top row of tubes in the back head. A coating of graphite is usually placed upon the plug thread before inserting it



FUSIBLE PLUG ATTACHMENT.

into position, so that it can be removed at any future time with ease.

The sketch illustrates how one engineer installed fusible plugs with what he claimed satisfactory results. His idea was to have the plug so inserted that he would not have to shut down if one melted out.

The hollow cap B was screwed into the tube sheet D. The cap was filled with Banca tin and there were openings into the steam space at E E. C is one of the

1857 1918

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SARNIA CANADA

1857 1918

boiler tubes. If the plug melted it would run out at E and steam would blow from the valve A, to which a small steam whistle was attached.

This called attention to the danger, and if the water was not below the column, the cock could be closed until evening, when the boiler could be blown down and a new plug inserted.

HOT WATER PIPES AND FROST

It is a constant observation that during a sudden cold snap hot water pipes burst, while the cold water usually freezes up tight without rupture of the pipes carrying it. A French experimenter has recently looked into the cause of this. He finds that the hot water invariably falls to several degrees below zero Centigrade before beginning to solidify, and that the ice then formed is perfectly solid and transparent. Ordinary cold water, on the other hand, begins to congeal as soon as the "freezing point" is reached; this ice is filled with air bubbles, and presents a soft and mushy appearance.

The explanation is that the air and other impurities in ordinary water furnish nuclei of crystallization. Ice formation thus begins sooner and proceeds more slowly than if these were absent; and the ice formed is more mobile, so that pressures are not so severe. Hot water, however, is to a large extent free of gas particles, which have passed off during the process of heating, so this effect is not observed. Freezing does not take place gradually, but all at once, with somewhat of an explosive effect; and there is no cushion of gas bubbles to take up the shock. That this explanation is correct is indicated by the fact that when a current of air is forced through the hot water just before freezing, it behaves in every detail just like cold.

MARKET CONDITIONS AND TENDENCIES

(Continued from page 25.)

fortable one, as there is no industry suffering from the lack of copper supplies. Consumers are quite generally well covered for the first quarter of 1918. Locally the market held steady at 30c to 32c per pound for casting copper.

TIN.—Stocks of tin held in London on December 1 are reported to be 4,891 tons, or over double normal. However, three-quarters of this stock is known to have been sold previously to America and held there awaiting permits to ship. It is also believed that considerable stocks of tin have accumulated at Singapore and Penang. There is, however, very little free tin that can be sold in the primary markets as a new transaction. Should heavy stocks of tin arrive for this continent it will mean that they are being shipped against old orders, and that they will be for consumers. Locally the tin situation held firm, quotations being made on the basis of 78c to 80c per pound.

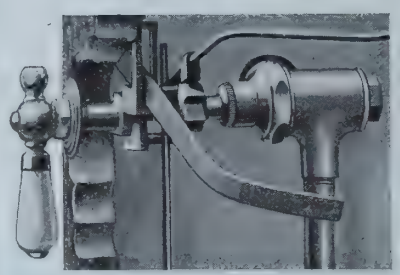
SPELTER.—The United States Navy Department and the United States Government are in the market for a combined amount of 5,000 tons of spelter. These inquiries by Government interests are encouraging to producers, and in the opinion of many of them seem to herald more extensive buying on the part of the Government. A buying movement would in all probability put a greater measure of firmness in this market. Locally prices held unchanged at 9¾c to 10½c per pound.

LEAD.—There is a firmer undertone to the lead market at primary points, due to slightly higher prices that are being obtained in the Western lead centre at St. Louis. Demand for lead is not large. In the local market prices held unchanged at 8¾c to 9c per pound.

ANTIMONY.—There is a steadiness in the market for antimony, as there was little activity in primary markets. Locally prices held unchanged at 16c to 18c per pound.

ALUMINUM.—The market held steady, with demand light. Quotations were unchanged at 60c per pound.

PIG IRON.—The coke situation continues to be the factor of engrossing interest in the pig iron market. So far Canadian manufacturers have had sufficient to meet their requirements. Transportation continues to be an uncertain factor. It is hoped, however, that with the taking over of the United States railways by the Government delivery of raw materials will be greatly facilitated. Quotations held unchanged at $50 per ton for foundry iron.



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Are not these reasons enough? Then why hesitate longer?

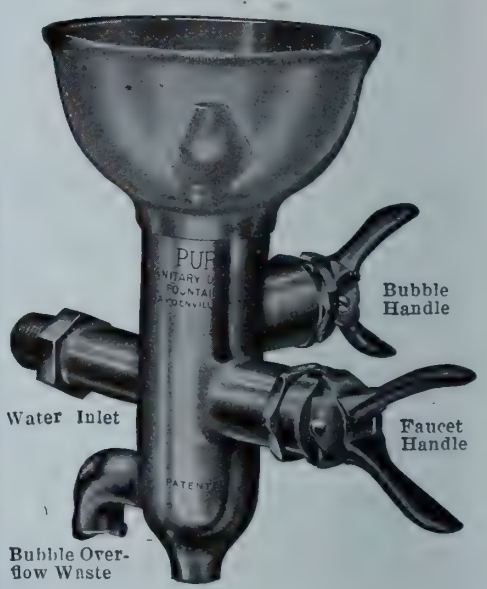
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Oxide of iron paint, mixed with linseed oil, makes a serviceable fire-retarding paint, because its surface is quite hard and non-inflammable so far as sparks are concerned. The paint may be further improved by the addition of fine sand. A spark may fall on such a paint and burn itself out without doing any damage.

A WRITER in the *Scientific American* estimates the cost of placing an anti-submarine net from the Belgian coast, just north-west of Ostend to Lindesnaes, Norway, where the water varies from 100 feet to 150 feet deep at £20,000,000, which he considers not excessive considering the results to be obtained.

Boiler Mountings, Steam Specialties, Engineers' and Plumbers' Supplies



J.M.T. REDUCING VALVE

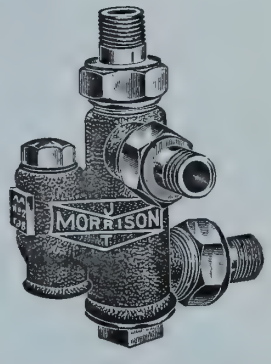
Will not equalize, is extremely sensitive and will maintain a steady reduced pressure regardless of the variation of the initial pressure.

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J.M.T. IMPROVED INJECTOR

Operates successfully on steam pressures from 20 to 220 lbs. per sq. inch. 4 to 400 horse-power.

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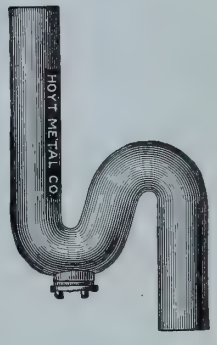
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Hoyt Lead Traps, bends and waste pipe are in a class by themselves.

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C. A. Dunham Co., Ltd., Toronto.

Drainage Fittings.
Canada Metal Co., Ltd., Toronto.
Steel & Radiation, Ltd., Toronto.

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Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London, Ont.
Pure Sanitary Drinking Fountain Co., Toronto.
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H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Toronto Hardware Mfg. Co., Toronto.

Pipe Threading Tools and Machinery.
Borden Canadian Co., Toronto.
John Hall & Sons, Ltd., Brantford.
A. B. Jardine & Co., Hespeler.

Pipe Wrenches.
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Trimont Mfg. Co., Roxbury, Mass.

Porcelain Ware.
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Galt Brass Co., Ltd., Galt.
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L. Wolff Manufacturing Co., Chicago.

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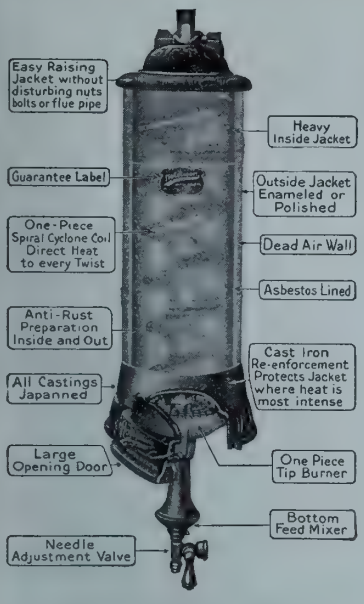
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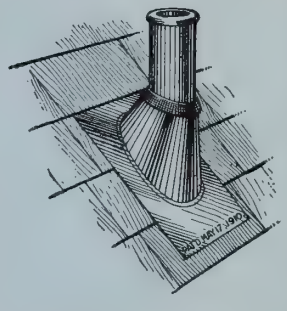
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No. 16


No. 17

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They fit any pitch from flat to 50°. Easy to apply. Made of heavy gauge galvanized iron, with pure lead collar soldered on, not merely pressed on.

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A Book Just Off the Press

Every sanitary engineer should be the possessor of this book. It deals with pipe-making of all kinds, cast iron, wrought iron, steel, wood and tile pipe. It is valuable because it gives the users of pipe a true idea of how pipe lasts under various conditions when in service.

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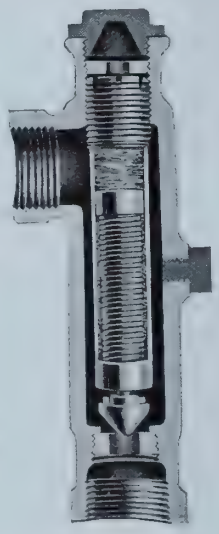
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Trap Every Steam Line

With a "SARCO"— Radiators Too



The Steam Trap "SARCO" is not like other steam traps, it relies on the expansion of a heavy hydrocarbon oil operating a Sarco spirally corrugated Tube within a renewable cartridge. When steam reaches the cartridge, the trap closes and no steam escapes. When condensation collects the trap opens and discharges it.

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Prices low. Write us at once. Can make prompt deliveries.

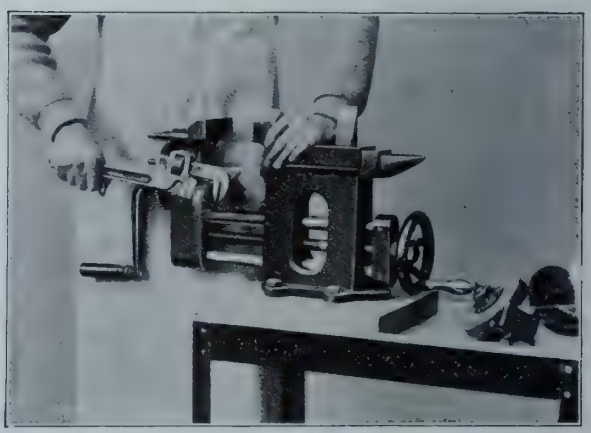
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The Equipment Comprises——

A Pipe Vise
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A Two-Speed Drill
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It's not a toy. It's a real combination of practical tools for practical people.

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King Boilers get up heat quickly

Very shortly after the fire is lighted in a King Boiler hot water reaches the radiators. The thin, peculiarly shaped waterways in the "King" mean quickly heated water and perfect circulation. The perfect circulation causes a saving in fuel because it obviates the necessity of "extra firing" to move cold water from the radiators.

The Trade should use this quick-heating, fuel-saving argument now while fuel is scarce and high in price.

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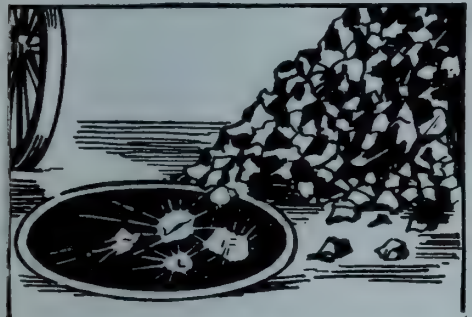


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JUST LOOK THERE–

The steam user just as well might dump coal into a sewer manhole as go to the trouble of firing up his boiler and then waste the steam by exhausting it in the draw. Don't waste. Use the COLE COAL SAVER — the Cole Return Trap.

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TOOLS

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Kindly mention this paper when writing Advertiser.

MacLean's Magazine

for JANUARY

Chasing the Submarine---by a Canadian

A CANADIAN, whose name is withheld, in the Motor Boat Patrol Service in the North Sea, tells in the January MACLEAN'S the story of the work and life and triumphs of the Service to which he is attached. It is a fine performance by MACLEAN'S to get this story for the Canadian people. Successes of this sort have made MACLEAN'S go far forward in public favor during past months.

If the horrid and terrible submarine warfare and the conquest of this pest of the deep interest you, learn more about submarines and their capturing in the January MACLEAN'S, and pass on to others the news of this unsigned contribution.

Ships---more ships---and yet more ships

THIS is a very strong article which Miss Agnes C. Laut contributes. As usual she is very well informed. Regarding the duration of the war she voices American opinion when she says that it is likely to be long drawn-out. The United States people are buckling down to a stern struggle. At this time we want very much to read what well-informed, virile thinkers and writers have to say about the war, since things are not any too bright in certain directions. Miss Laut has a good deal to say about the shipping programme of the United States, and certainly she gives facts and sets us thinking as few writers do.

"Jim" by Robert W. Service

A POEM by this strong poet—a poem wrought amid the smoke and hell of battle, yet fanciful and tender One wonders how men can write fanciful verse amid surroundings that seem so adverse to thinking and writing, yet some gifted can detach themselves and let fancy play; or is it that their minds see through the real and horrible—through the immediate environment into inner things? Whatever it may be, we ought to be glad for the verse that men like Service give us, remembering how and where it is produced.

Adam and Arthur William Brown, Brothers

ADAM BROWN is a Canadian short story writer of large promise. His brother, Arthur William, is one of New York's foremost illustrators. Both brothers have joined their gifts to make Hannibal Helps a mighty good feature of the January MACLEAN'S.

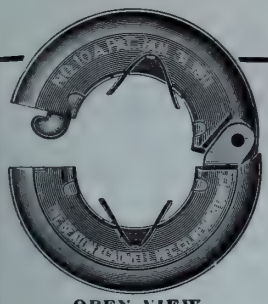
A New Serial by Alan Sullivan

ALAN SULLIVAN'S recent novel, The Inner Door, is being well received. Perhaps we have no better novelist of his type in Canada to-day. He writes books that show introspection and fine analysis. This serial, The Magic Makers, adds venture and mystery to psychological study, and is a rare good thing. Arthur Hemming illustrates the story, which begins in Scotland and is transferred to Canada where the stage is set.

The Regular Departments of MacLean's

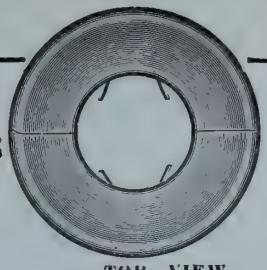
REVIEW of Reviews, Women at Work, The Business Outlook—are present in goodly measure. Oppenheim's The Pawns Count, Trench Pictures, and first-class illustrations by artists of note help to make the January MACLEAN'S good value for money.

At All News Stands, 20c



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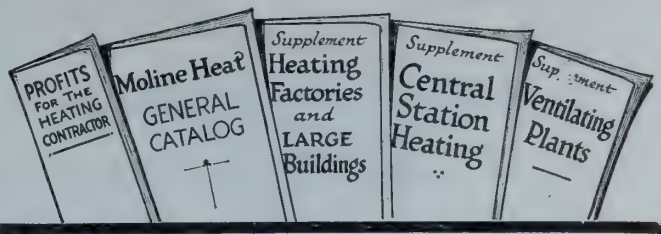
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BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.

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TORONTO, CANADA

PIPE AND THE PUBLIC WELFARE

By R. C. McWANE

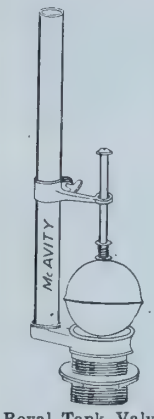
A Book Just Off the Press

Every sanitary engineer should be the possessor of this book. It deals with pipe-making of all kinds, cast iron, wrought iron, steel, wood and tile pipe. It is valuable because it gives the users of pipe a true idea of how pipe lasts under various conditions when in service.

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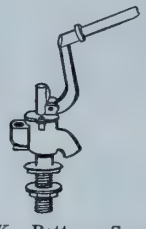
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5-in. Copper Float Soldered



Valve Float



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Low Tank Diaphragm



Elevated Ball Cock, Rod and Refill Tube

McAVITY TANK FITTINGS

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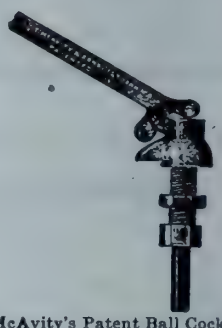
It's up to you to start business with us; it's up to us to make you continue. *You'll continue* all right!

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McAvity's Patent Ball Cock Straight Tail

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By the use of Figure 1 you save two threads, do neater work and make sure that the connection is trouble-proof.

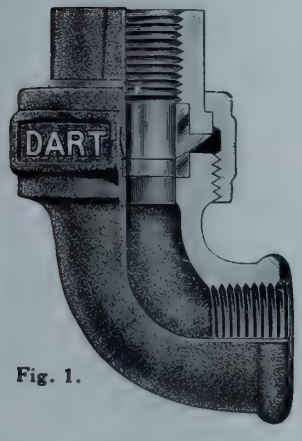


Fig. 1.

Dart Union Elbows

(Female, and Male and Female)

Dart Union Pipe Couplings

Tight—Permanently

Both Faces of the Joint are Bronze; there is no deterioration. The iron parts are extra heavy; they cannot stretch or pull apart.

Another advantage of using Dart Unions is that they are easily and quickly connected, whether pipes are in or out of line.

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TORONTO, CANADA

Figure 2 is a 4-in-1 fitting. It cuts out nipple and one thread at running end and nipple, elbow and two threads at the elbow end.

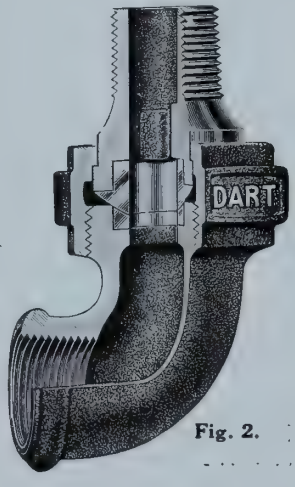


Fig. 2.

There Are Lots of Gate Valves



advertised and sold, but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.

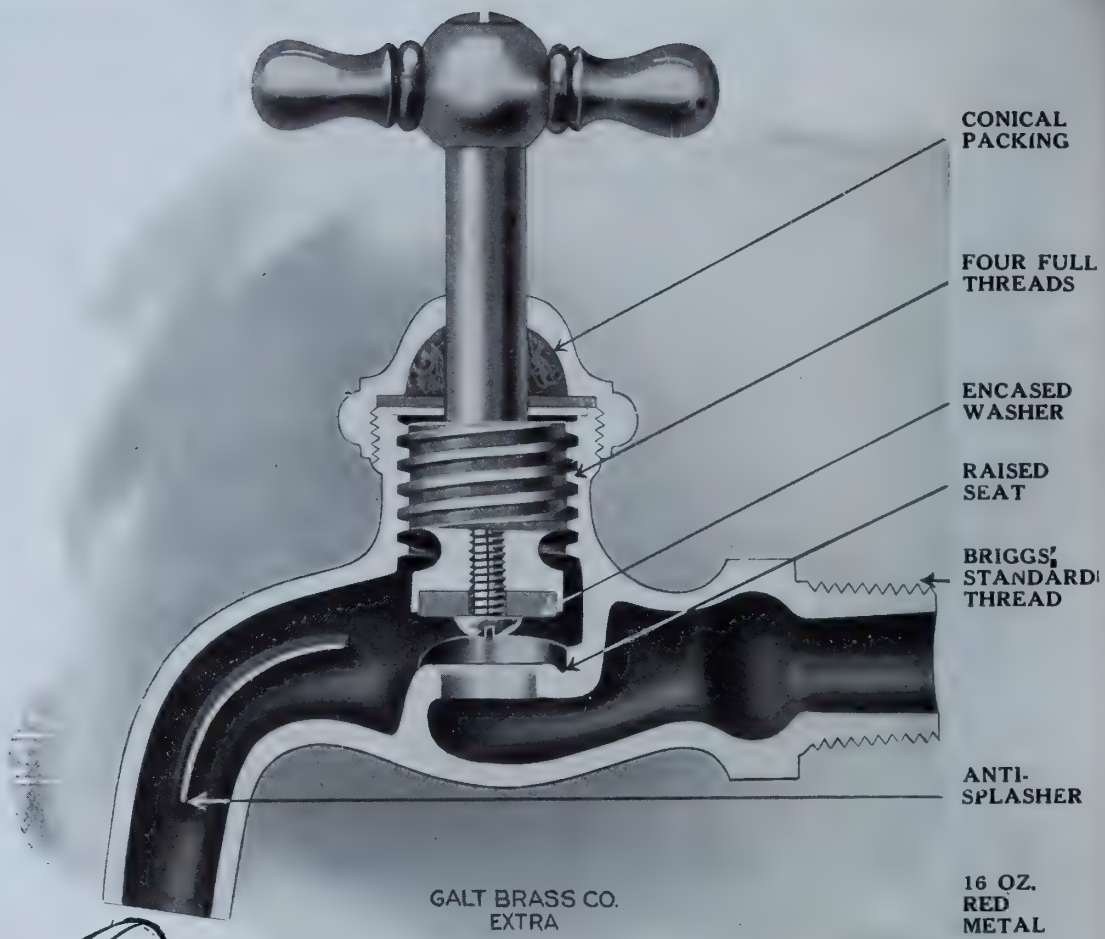
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Approved by the Fire Underwriters Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

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You Can Install This Line and Establish Confidence of Your Customers





GUARANTEE

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Galt, Canada

SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

Vol. XII. Publication Office, Toronto, January 15th, 1918 No. 2



A 237
Swan Neck
China Handle



A 238
Straight Neck
China Handle

"Kitchener" Packless Quick-Opening Bibbs

For kitchen, slop sink and laundry tray where quick and easy operation without splashing is desired.

"Kitchener" Packless, Quick-Opening Faucets are specially designed to give quick action and to prevent splashing. A half turn of the lever gives a full stream that flows smoothly from the long nozzle avoiding entirely spreading and spattering and reducing splashing to a minimum. They are made of a high-grade red metal and require no packing.

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LONDON TORONTO

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is a Lavatory Fixture Worth While



A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

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RUBBER SYSTEM
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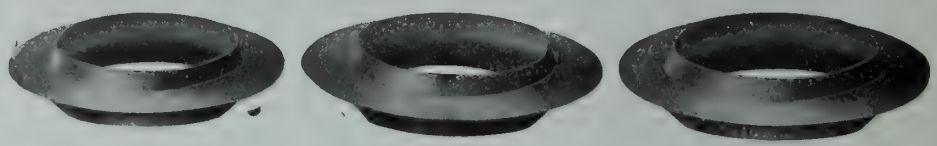
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"Toledo" Geared Adjustable Threading Tool No. 2 making a cut and thread on a 4-inch bend in position. It was desired to install a steam separator above throttle of engine, and the whole job was satisfactorily completed without removing the pipe line.

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A. B. JARDINE & CO., Limited, Hespeler, Ont.

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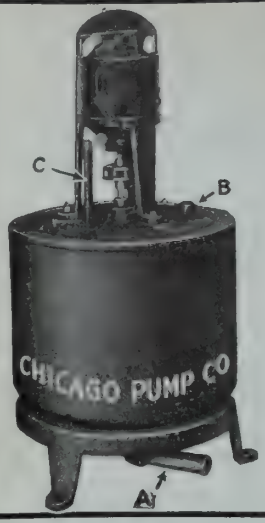
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SIMPLE—DURABLE—POSITIVE

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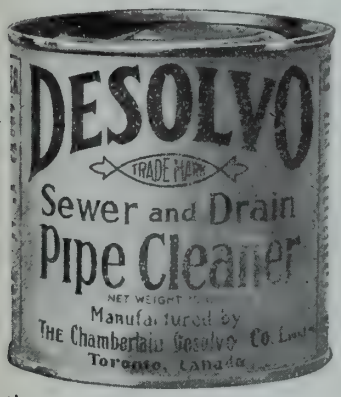
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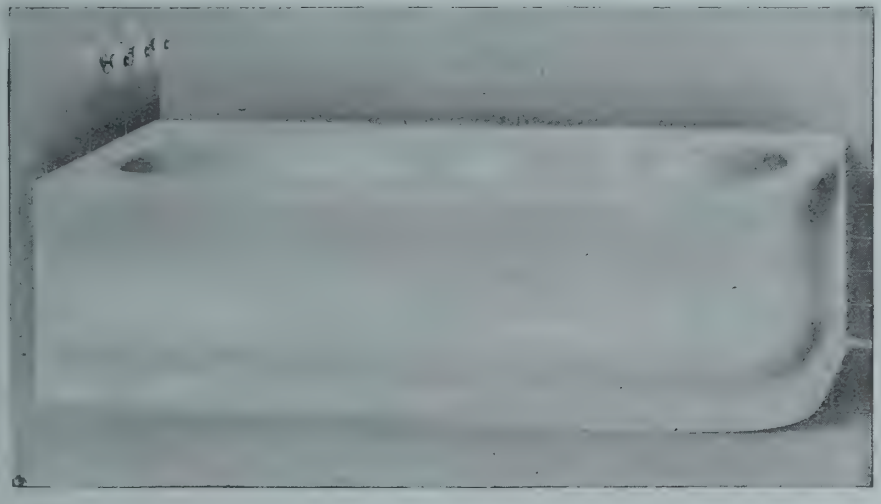
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The "Perfection" Built-in Bath is only 17½ inches high, therefore convenient. It builds into walls and floors, the absence of all dust-collecting cracks and corners, meaning bathroom sanitation.

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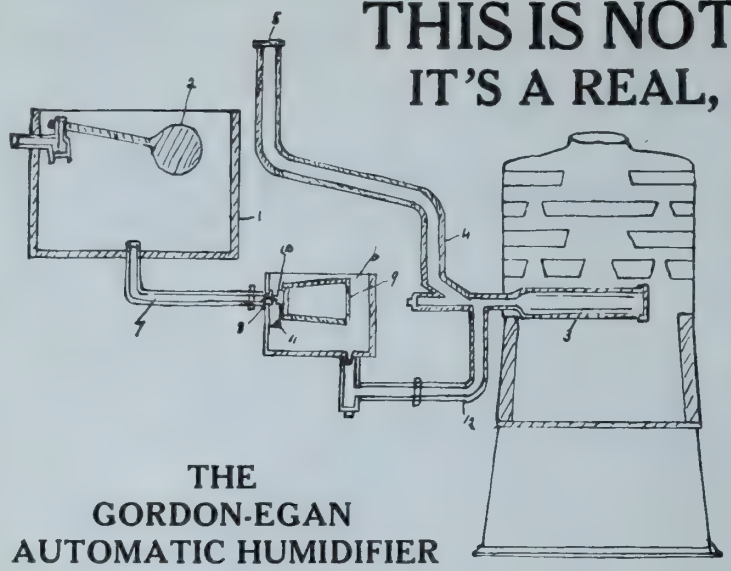
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It can be installed easily and without disturbing the furnace when fire is needed.

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Our apparatus has been in use for over three years and during that time has not required any attention. It is automatic in operation and furnishes water as required.

Write for our prices and book of instructions entitled "Automatic Humidifier."

Fig. 1—Cistern to feed Humidifier.
Fig. 2—Ballcock of Cistern.
Fig. 3—Generating Chamber in Furnace.
Fig. 4—Steam Outlet Pipe from Generating Chamber, 1" diameter.
Fig. 5—Grating in floor for steam outlet.
Fig. 6—Small tank to regulate supply of water in retort.
Fig. 7—Supply Pipe from Cistern to Small Tank.
Fig. 8—Adjusting Screws and Packing for Float in Small Tank.
Fig. 9—Float in small tank to regulate level of water in Steam Generating Chamber.
Fig. 10—Rubber Seat on Copper Float.
Fig. 11—Hinge for Small Copper Float.
Fig. 12—Pipe from Small Tank to Retort.

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Is a real little wind engine. Will make ventilation positive.

No auxiliary heater required on local vents where a "Bicalky" is installed. Just take a good look at the illustration on page 6 of last issue and read the article which appears in the same issue on page 22.

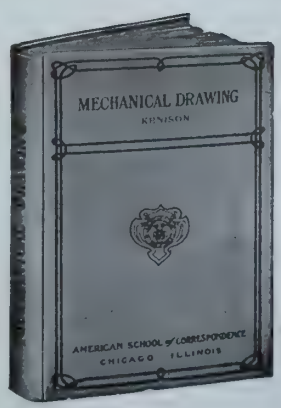
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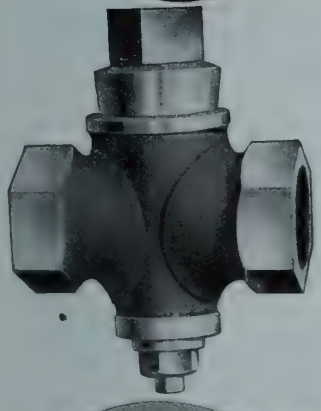
Every sanitary engineer should be the possessor of this book. It deals with pipe making of all kinds, cast iron, wrought iron, steel, wood and tile pipe. It is valuable because it gives the users of pipe a true idea of how pipe lasts under various conditions when in service.

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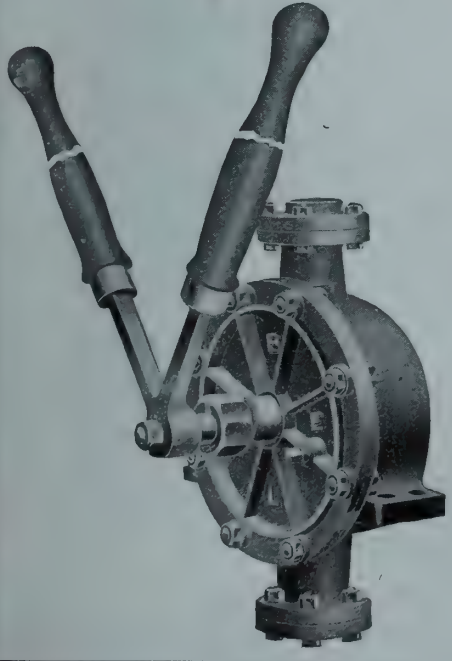
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Gunmetal and Brass Valves and Cocks.
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SANITARY ENGINEER
PLUMBER AND STEAMFITTER OF CANADA

Vol. XII. TORONTO, JANUARY 15, 1918 No. 2

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Cast Iron vs. Clay Tile for House Drains—Practical Men Needed at the Head of Affairs.

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Vitro No-Trouble Tanks

You cannot procure a "just as good" substitute, because there is no substitute of a "Vitro" tank made and we are the sole manufacturers of the genuine "Vitro" no-trouble tank in Canada.

Made in White, Oak and Mahogany finishes.

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The resolutions you have adopted to help make Nineteen-Eighteen your very best business year will gain added force if you determine to hitch up to Port Hope Enamelware.

Port Hope Enamelware makes a splendid running mate to **good** resolutions because it is so good itself. Like the sincere resolution Port Hope Ware countenances no half-way measures. It is made up to a rigid standard of quality—no seconds—every piece "first grade."

From the first it was resolved to make only one grade—and that the best possible. This tended to eliminate all chance of slighted work. Every workman in the Port Hope factory is constantly striving for better results, and efficient supervision and inspection prevent any mistakes.

The beautiful snow-white appearance of Port Hope Enamelware, and the uniformly excellent service it gives are the result of closely following a good resolution. Hitch your good resolutions up to ours and let's pull together for bigger, better and more profitable business in Nineteen-Eighteen.

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SANITARY ENGINEER

VOL. XII JANUARY 15, 1918 No. 2

Public Comfort Stations in Winnipeg

The City of Winnipeg Far Ahead of Many Other Canadian Cities—Has Given Special Attention to the Public Comfort Station Problem—No Doubt More Will be Erected if Found to be Necessary

By Jas. Smith, Chief Sanitary Engineer Dept., Winnipeg

LIKE a good many other cities throughout the Dominion, Winnipeg relied to a great extent for comfort station accommodation on the hotels, particularly in the centre of the city. About two years ago, however, when the prospect of the McDonald Act which banned the bars, coming into force in June, 1916, was assured, our city fathers became alarmed over public lavatory accommodation, which would be quite inadequate if, as was supposed and threatened, a great many of the hotels were closed down. In consequence, estimates were prepared and an appropriation of $25,000 was made to provide two comfort stations, one at corner of Main & Logan and the other at corner of Selkirk and Main. In due course plans and specifications were drawn up, tenders called for, and the contracts let and both comfort stations have been in operation for nearly six months. The plans and specifications were prepared in the office of the building Inspector, Mr. E. H. Rodgers, and the building designed and detailed by Mr. R. E. Davies, architect in the building inspector's department. Haxelton & Walin Ltd., 609 Electric Railway Chambers, were the general contractors, and Cotter Bros., 207 Fort Street, were the plumbing contractors, to both of whom much credit is due for the excellent manner in which their work has been completed.

There are several unique features about these comfort stations. In the first place they are sweat proof, being a shell within a shell, the outer shell being of concrete and the inner shell of baked enamelled steel. You will also see by examining the plan that the pipe chambers behind the fixtures are very roomy, and the floor of pipe chamber is about 18 in. lower than floor of lavatory, so that all the piping is exposed to view, even the drains. In this country where so much trouble is experienced with frost at soil pipe terminals, it would have been impossible to protect a stack running through a superstructure such as is shown here without grave danger of it becoming continually blocked with frost,



JAS SMITH
Chief Plumbing Inspector, Winnipeg.

so we did not run a stack at all but carried the 4 in. vent pipe through wall of comfort station and turned it into a manhole specially built alongside station. In this way there is no possibility of trouble from frost, and the manhole can be constantly kept under observation. The ventilation is very complete for buildings of this nature heated by electricity, although the buildings are so designed that they can also be heated by steam, gas or hot air if thought advisable.

These are the first comfort stations built in Winnipeg under the direct control of the city officials, they are plain, serviceable and permanent structures, and were designed to give the best and greatest accommodation at a minimum cost.

The accompanying table shows the accommodation and capital cost of stations constructed in recent years, also the cost per fixture. It will be seen that most recently constructed stations cost much less per fixture than those built in 1914-15 in spite of the fact that material had increased considerably in that time.

Winnipeg has now got five stations, three of them are combined stations, that is they are for both sexes in the same structure, while the other two are separate buildings for each sex placed in side streets off Portage Ave. one block apart.



Comfort Station, Winnipeg, cor. Logan and Main, in course of construction.

SPECIFICATIONS FOR PLUMBING AND VENTILATING OF COMFORT STATIONS

Plumbing

These specifications and drawings are intended to cover the installation of a complete system of plumbing, including plumbing fixtures and their fittings. The contractor shall guarantee to keep in repair all work done by him for one year except where damage is done through misuse or frost. All work must be executed in a proper manner, and to the satisfaction of the plumbing inspector of the city of Winnipeg, or his assistant, and in addition shall be carried out in accordance with the accompanying plans and specifications and the city by-laws governing such work. The contractor shall make allowance in his tender for all permit fees including sewer and plumbing permits.

Sewer Connections

Construct a 6 in. sewer connection from main sewer on street to a point 8 feet outside wall of building.

Drains

Construct and connect 4 inch C. I. drain from sewer connection into and throughout building as shown on plan, with all necessary connections, with clean-outs and floor drains where necessary and having a 4 in. hub valve on the drain immediately it passes into the building, said valve to be built into a waterproof valve chamber 2 feet in diameter constructed of concrete, the gate valve to have brass trimmings and wedge gate, valve spindle to be fitted with wheel and spindle extended so that wheel is not less than 3 in. below floor.

Vents

Vent pipes are to be constructed of galvanized W. I. piping as shown on plan, and main 4 in. vent to be extended with C. I. piping through wall of building into manhole at a point not more than 5 feet above the floor of the comfort station. All vents to be properly graded.

Floor drains in ladies' lavatory to be formed of 4 in. pipe with bends turned up and fitted with 8 in. frame and brass cover.

Rain Water Leaders

Construct (2) two inch rain water leaders of C.I. piping discharging into catch basin.

Drains for Drinking Fountain

Construct 2 in. wastes with trap from drinking fountain to catch basin.

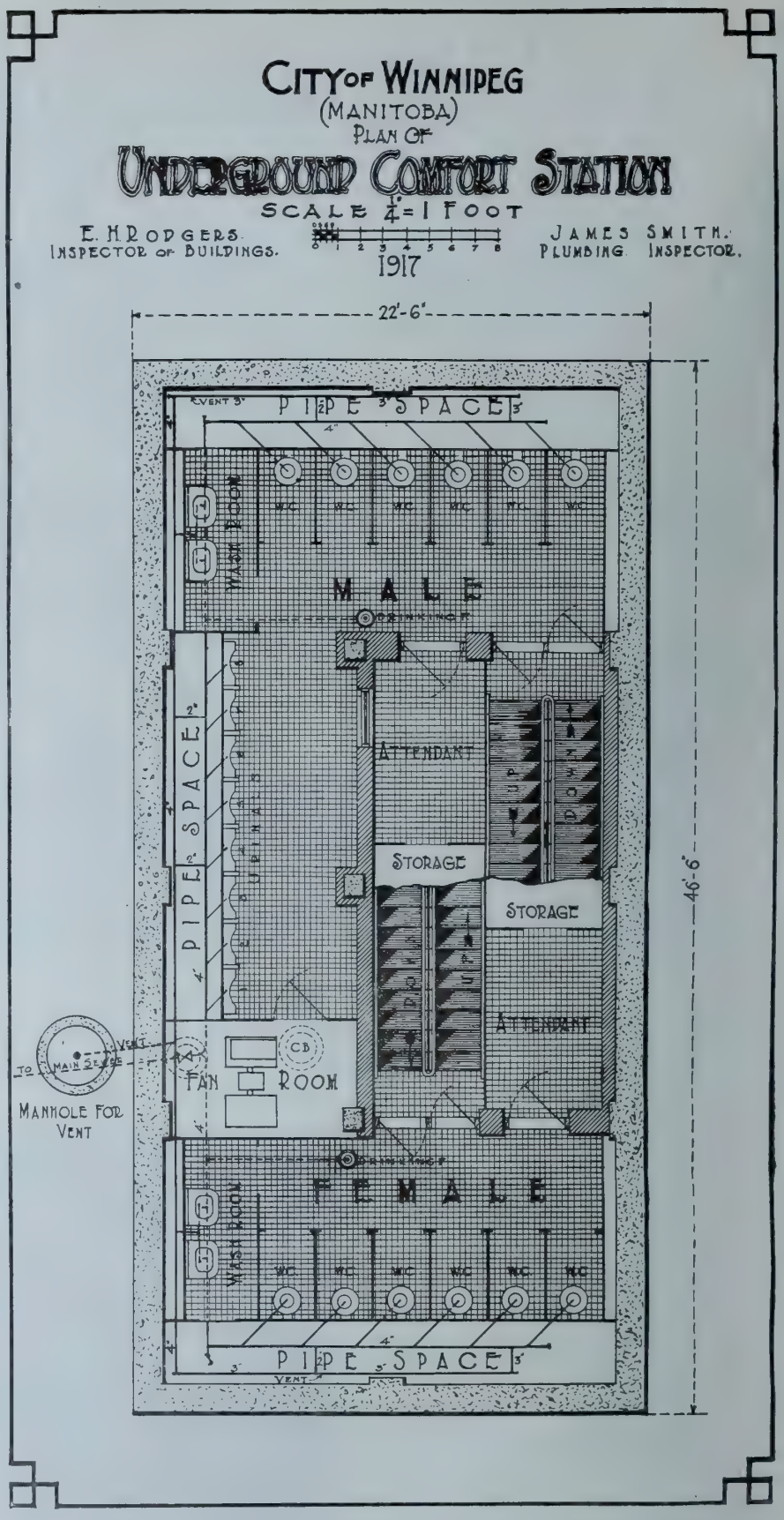
Water

Construct and lay a 4 in. C.I. water supply pipe from water main on street into building, and run 2 two inch branches to each lavatory taking off 1½ connections to each.

W.C. Each branch to be fitted with standard brass gate valve. Also run ½ inch connections to each urinal tank and hot and cold supplies to basins, said connections to be fitted with ½ in. compression cocks. All valves and stop cocks to be placed in pipe chamber behind fixtures, all exposed supply pipes and fittings to be heavy N.P. Brass Supply and fix 1 N.P. hose bib cock and extension, position to be located by the architect. Supply and fix 40 gallon hot water tank complete with W.I. stand and fittings in fan room. The tank is to be fitted with an electric water heater of the Westinghouse type.

Water Closets

Supply and fit up twelve water closets of the acme syphon jet centripetal ac-



tion pattern (plate G. 1885) G. Jas. Robertson Co's. catalog fitted with concealed Kenny flushometers, pull-button pattern with recessed face plate, and oak seats heavily reinforced all round with N.P. brass flange with Crown bumpers inserted all around side of seat.

Water closet bowls to be connected with C.I. bends with heavy brass floor flanges caulked in.



Comfort Station, cor Selkirk and Main. Front view—Women's entrance at other end of building.

Urinals

Supply and fit up complete eight (8) class "B" craftsman interlocking ideal porcelain urinals (plate 3583N.) Trenton Potteries Co's. catalog with integral seam covers, twenty-four (24 in.) inches wide and forty-eight (48 in.) inches high, to be fitted with two (2) eight (8) gallons vitreous china automatic flush tanks to be placed in pipe chamber and supplies brought through partitions. Each urinal to be trapped separately by a 3 in. C.I. trap in pipe chamber with full size clean-outs as shown on plan. Outlets from each urinal to be fitted with rose strainer.

Wash Basins

Supply and fit up two wash basins 24 in. x 21 in. complete as shown on plate 2563 N. Catalog Trenton Potteries Co., fitted with self closing cocks and supported by wall brackets and leg to floor.

Drinking Fountain

Supply and fit up 2 drinking fountains complete as shown in Plate 6549 Standard Sanitary Catalog, fitted with push-button head and loose key stop on supply fountain. Standard to be painted with 3 coats of white enamel paint.

Soap Dishes, Toilet Paper and Towel Holders

To be supplied and fixed to the entire satisfaction of the plumbing inspector or his assistant.

Ventilating System

The contractor is to instal a complete system of ventilation with motors, ducts, cut-out switch, meter brackets etc. The fresh air supply fan will have a capacity for delivery of 1,150 cubic feet of air per minute, and the foul air fan 862 cubic feet of air per minute. Both fans will require not more than 45 H.P.

FRESH AIR SUPPLY

Fresh air supply is taken from intake flue of an area of 200 square inches and is connected to a flue where shown on plans, of an area of 144 square inches and discharged into male and female apartments through 10 inches by 16 inches registers; these registers are located in the ceiling.

Foul Air System

Foul air system consists mainly of 4 inch connections at each closet connecting to 6 inch by 6 inch registers located approximately 12 inches from the floor and connected to a duct with an area of 80 square inches.

Fan

Fan consists of two (2) multivane type exhaust fans, with wheels overhung on extended shaft of Sturtevant type "B" direct current motor. Motor to be supported on steel plate box (or C.I.) attached to fan housing, making a rigid compact unit.

Ducts

Ducts to be made of 22 gauge iron (galv.) with lap and soldered joints and where exposed in lavatory to be enameled white with three coats of enamel.

Registers

Registers to be all nickel-plated with hit and miss closures. Intake and exhaust to have copper mesh 1 in. square and all to be constructed to detail.

FOUL AIR AND DISEASE

"Free as the air we breathe" is not applicable to foul air. Like most other commodities the latter exacts a toll from everyone who uses it. Lowered vitality, with a consequent predisposition to such diseases as colds, pneumonia and tuberculosis, is the price that is paid for breathing impure air. It is probably true that a large percentage of the homes in countries possessing a climate similar to Canada's are, to a greater or less extent, breeding places for such diseases, especially during winter months. This is the outstanding reason for the marked prevalence of such diseases in Canada, diseases for which fresh air is the most potent remedy.

Tightly closed rooms constructed for the sole purpose of retaining heat, soon become filled with poisonous gases exhaled by the inmates. The remedy is, of course, better ventilation. It can only be a question of time when our governments will insist that scientific ventilating systems be installed in all new buildings. Public health and public opinion will demand it. In older buildings, where the only ventilation is obtained from windows, the air may be "flushed" by opening the windows at intervals for a few moments. This means a loss of some heat, but, if the windows are not left open too long, the saving in doctor's bills will more than offset the extra cost of fuel.—A.D.

St. John, N.B.—Tenders are being received on boilers, pumps, valves and fittings, etc., for the Municipal General Hospital.

Location—	W.C.'s	Urinals	Basins	Drinking Fountains	Total	Grand Total	Capital Cost	Cost per Fixture
Fort St. (male), built 1914-5	6	12	2	1	21	31	$25,777.35	$812.17
Garry St. (female), built 1914-5	7	..	2	1	10			
Logan & Main (male)	6	8	2	1				
Logan & Main (female) Built 1916-17	6	..	2	1				
Selkirk & Main (male)	6	8	2	1				
Selkirk & Main (female) Built 1916-7	6	..	2	1	26	52	$27,102.15	$521.19

Push Yourself to Higher Profits

Every Man His Own Salesman — The Shame of Remaining Poor — Most Men Can Double Their Pay and Profits—Examples of Self-selling—To Get More, Sell More—Paying Dearly For the Privilege of Being a Leaner

By John C. Kirkwood.

EVERY right-minded man wants to get on in the world—to get higher up and to get higher pay. But not every man with the desire to get on is trying to get on. Many are in a state of semi-repose, waiting for someone, or some force without themselves, to promote them. Because of their lack of initiative, many good men lag behind and remain poor.

No Virtue in Being Poor

Let it be said straightway that there is no virtue in being poor, or lowly-placed, but that, on other hand, there may be discredit and disgrace in being poor and lowly-placed. Many a man earning no more than "the scale" or the market price for the particular kind of service rendered by him should be earning twice as much as he is now getting; and he can earn double his present wage if he has the grit and purpose to multiply his wage by two. The great obstacle in the way of the advancement of many wage-earners in position and pay is a certain contentment with their wages and positions—a contentment that robs them of initiative and ambition.

Leaning on Broken Reeds

Go into any place where men earn wages—so much pay for so much service—and ask each man what he is doing to get on—to get higher up and to get more pay; and the great majority will say, "I'm trying to do my work just as well as I know how. I hope that my employers will perceive my fidelity and the good quality of my work; and that they'll promote me and advance my pay."

You will get an answer like this from common laborers, from skilled artisans, from clerical workers, from executives, from managers, from salesmen, from teachers and professors, from chemists and engineers, from journalists and editors—in short, from all classes of employees.

These men seem to have been taught —perhaps self-taught—that fidelity, ability and first-class performance will, unaided, send them upward and forward. The truth is that while fidelity, ability and superior performance are the bases of advancement, promotion should get its impulse from the employee himself. In other words, if a man wants to get ahead, he should push himself ahead. Failure to get ahead is very often explained by absence of self-pushing.

Doing More Than a Day's Work

If a man wants to get ahead, in pay and position, he must do more than just perform his day's work well. He must, at the same time, be preparing himself for a job higher up—getting ready in advance, by special study. The man who is studying for a job higher up, with the higher pay that usually goes with a higher grade or quality of service, usually possesses purpose. Purpose and Push begin with the same letter. Indeed, if you look at the words relating to advancement, they all seem to be "P" words:—

Purpose	Prod
Push	Practice
Progress	Principles
Promotion	Pep
Power	Performance
Perseverance	Personality
Punch	Proficiency
Preparation	Prosperity
Persistency	Promptness
Pertinacity	Pluck
Polish	Popularity
Publicity	Perception

Failures omit from their vocabulary many of the "P" words listed above—purpose, push, preparation, power. They seem to prefer words beginning with "L":—

Leisure	Laxity
Laziness	Loitering
Listlessness	Languor
Limpness	Lounging
Looseness	Lateness
Lagging	Lackadaisical
Leaning	Lukewarmness

You, the reader of these words, can get some index to the quality of your own life by answering honestly this question —Am I a "P" man or an "L" man?

I.

WHAT are the chances of getting on for an artisan—a machinist, or moulder, or shipwright, for example?

Or to put it more broadly: What are the chances of getting on of the wage-earner—the man who gets so much an hour, or day, or week, or month?

Or to put it more broadly still: What are the chances of getting on for employed men—men who sell their skill, or fidelity, or knowledge, or ability to perform technical or semi-technical work, including professional men such as engineers, teachers, chemists, and so on?

Getting the Right Idea

The chances of getting on, in pay and position, of any class of worker, can be made very certain—almost certain—if the worker himself (1) gets the right idea and (2) has the grit to follow the right idea in the direction of its beckoning.

The right idea is: Every man must sell himself, by the exercise of his own initiative, to those who will pay him his worth; and he must keep on in this selfsame selling effort.

You ask, How can a man sell himself? What do you mean by "selling himself?" Let us answer these questions with suggestive illustrations.

A printer—a compositor—went to his employer with a new floor arrangement of composing frames, imposing table, galley racks, linotype positions, paper-cutting machine, presses, and so on; an arrangement that meant less waste motion, much saved time, and greater output at no increased cost. For his initiative and because of the indubitable value of his suggestions, this compositor was promoted to a higher position, with higher pay. This compositor sold himself to his own employer—sold an idea of his own thinking and observation. He did not wait for promotion, but speeded its coming by an effort of his own.

A Carpenter Has a Bright Idea

A carpenter showed his employers—a wood-working firm—how they could utilize much waste wood for the making of small wooden toys. For this suggestion, representing, as it did, a new source of revenue, and ultimately a new and highly profitable department, this carpenter was promoted in position and pay. In other words he sold something —an idea, a new business—to his employers.

A grocer's clerk showed his employer how he could find a new and extensive customer out of whom much extra profit could be made. He suggested that his employer should open a restaurant at a location where a restaurant was greatly needed. The grocer took up the suggestion, and found himself selling bread, biscuits, canned vegetables, tea, coffee, cheese, fruits, pickles, rice, potatoes, and a score of other grocery lines at higher-than-store prices, and always for cash. The grocer's clerk making the suggestion was given an interest in the new undertaking, and improved his income very substantially. That is, an employed one sold something of his own —an idea—to a buyer of it, and was well paid for his merchandise.

He Sold Himself to Himself

A machinist took up a correspondence course in draughtsmanship, in order to lift himself into a higher grade of occupation, with higher pay. When fully prepared, he applied for a position advertised, got it, and improved his grade of employment. While a draughtsman, he prepared himself as an electrical engineer, taking evening work in an institute of technology; and finally its examinations. To-day he is a consulting engineer, obtaining high fees. The machinist became possessed of market-

able wares which brought in a higher rate of pay than the sum per hour he received as a machinist. In other words, he sold himself—his ability and training—in a better market; and he continued to sell his wares—his ability and training, which he steadily improved—in still higher markets.

A teacher in a High School took post-graduate work at Harvard, secured his degree of Doctor of Philosophy, and in the course of a few years of directed purpose became a University professor at a higher annual remuneration than he could ever hope for as a High School teacher. At the same time, he increased himself in prestige, and shortened his working year from September-June to October-May. This teacher, by preparation, guided by purpose, and by the exercise of initiative, sold his wares—superior learning—in a better market.

A manager, on salary, wanting and needing more money, conceived the idea of a central buying agency for a number of retailers. He took his idea to an astute business man and sold it to him along with his own services. To-day that manager is making five times what he formerly made, and owns a substantial interest in the business he originated.

Promotion Lags For Some

The men who get ahead in this world are those who lift themselves to higher positions, who acquire fitness for higher positions in advance of seeking and occupying them. Most of us are willing to take higher positions and higher pay, promising ourselves, if we get higher positions and pay, by favor more than desert, to qualify for the higher post and pay afterward. Promotion lags for the unprepared, and rightly so. Men that won't move forward beforehand are not likely to carry into higher posts a progressive spirit.

II.

THE message of this contribution to SANITARY ENGINEER is addressed in particular to those who are not making progress in their business, their position or their pay. If you are worth more money than you are now receiving, it is a burden upon your own shoulders to get the money you are worth. It is for you to seek more money, some place, on your initiative. In other words, you must sell yourself to some buyer who will give you a better price for what you have to sell than you are now getting. Perhaps—probably—this buyer is your present employer.

You Must Have More to Sell

If you are not worth more money than you are now getting, and yet desire more money or advancement, it is clearly up to you to make yourself worth more money. In other words, you must have more to sell—more skill, knowledge, productive, executive, or managerial ability. Having more to sell, you are in a favorable position to demand more money or recognition, or both.

III.

IT has been said that there are two classes of people in the world—leaners and lifters; and the leaners are in overwhelming majority. These leaners want to be carried; want their way to be made easy for them; want other men to find work for them; need others to watch over them in order to do their best work; and want others to lift them to better-paid work and work of a better sort.

They remain dependent children all their life long; and if they get some kicks and curses for leaning their weight on others who want to get ahead, or for hanging on to the coat-tails of men of greater strength and speed, they feel aggrieved, and develop socialistic views. And when old age comes, these leaners, grown feeble from their much dependence, may become a burden on their friends or kindred or perhaps on the State.

Leaners or Lifters—Which?

The question is inevitable: Are you a leaner or a lifter? If you are a leaner, and continue to be one, you cannot possibly earn as much as the man of equal fidelity, ability and performance with initiative and courage to exercise these qualities.

When you lean on a man—rely on him to find work for you and keep you at work, for wages—you pay him a substantial sum each year for the service you require of him. If you get from an employer $3.50 a day, then he expects to get back $5 or so for the $3.50 he gives you; and he gets this $5 or so out of what you produce. That is, he expects to get $1.50 a day, or $9 a week, or $450 a year per employee over and above what he pays the employee. And if he employs 100 employees, it means that he gets $45,000 more than he pays them. Applied personally, it means that you, a leaner, pay your employer $450 or so each year as a fee for finding you work.

A Journeyman Plumber Gets the Right Idea

When this idea sank into the mind of a certain journeyman, he determined that he would sell himself to himself, and not to any other. He had a little money saved up—less than $500—and with this capital he opened up a small shop in the basement of his house. Here he worked nights until he developed a connection, so that it was not long before this man with initiative found it necessary to transfer his shop from the basement of his dwelling to a regular shop and to employ assistance. To-day this man is an employer, and is drawing a very satisfying income by collecting $1.50 a day or so from each of twenty men who want their jobs found and maintained for them.

IV.

HOW is it with you, brother? Are you depending on your fidelity, ability and superior performance to advance you in pay and position, or are you practising salesmanship—doing a little pushing on your own account in the direction you want to go? Are you acquiring more in order to be able to sell more—more education, more knowledge, more skill—in short, more of the kind of merchandise you are selling?

How are you using your spare time—the time you call your own? Are you converting it into capital for to-morrow's needs? Are you reading books above your level—the only kind of books that educate you, stimulate you, lift you? Do your dreams lull you to sloth and sleep, or do they drum you out of repose and inaction?

Time—your free time—is a godmother, ready to bestow all manner of wealth on you, if you are her beloved child.

None but yourself condemns you to positions of lowliness and low pay. If you want to earn twice as much as you are now doing, you can surely do it, if you make yourself worth twice as much, and make others know your worth. It's all up to you.

HAMMOCK HOURS

A MAN went for his vacation to a fly-haunted hotel in the North. There was a hammock in the grove behind the hotel, and one afternoon our friend climbed into it with pipe and book. But the flies tormented him unmercifully, so he climbed out again in disgust.

"Look here, landlord," he complained, as he entered the office, "what's the good of a hammock in such a fly-ridden spot as that grove?"

"Oh," said the landlord, "you didn't use the hammock during hammock hours."

"What are hammock hours?" asked the guest.

"Twelve to two, sir," said the landlord. "You'll find no flies in the grove then, sir."

"And why not?" demanded the puzzled guest.

"Because," said the landlord, "12 to 2 is dinner, and they're all in the dining-room then."

Sandy McNab, being a popular and well-known member of the village kirk, was asked by the minister to canvass the other members on behalf of a war charity he was interested in.

Soon afterwards the minister met Sandy walking irresolutely along the road, and at once guessed the cause.

"Man, Sandy," he said earnestly, "I'm sorry to see you in this state."

"Ah, weel, it's for the good of the cause," replied the delinquent quite happily. "You see, meenister, it's through these subscreeptions. I've been down the glen collectin' fun's, an' at every hoose they made me hae a wee drappie."

"Every house! But—but—but surely Sandy, there are some of the kirk members who are teetotallers?"

"Aye, there are; but I wrote tae those."

Clay Tile vs. Cast Iron House Drains

Misleading Statements Made re Use of Cast Iron in United States Towns--Burlington Newspaper Publishes Them—Investigation by Engineering Firm Proves Them to be Incorrect

CLAY TILE VERSUS CAST IRON HOUSE DRAINS

THE following letters have been received from a firm of consulting engineers who have the welfare of the public at heart. They have also a reputation at stake and take good care that when they specify certain goods the very best is none too good. This firm were the consulting engineers appointed by the Burlington Council to execute certain work and to advise upon work to be done. One part of their work was to compile a new plumbing by-law, in doing which they advised that cast iron soil pipe be used under all dwellings and buildings. Some of the Burlington people opposed the idea and considerable hard feeling prevailed for some time, the whole opposition being from men, who were either interested in the tile pipe industry or impractical men. However, we were pleased to see that right prevailed and Burlington is to be complimented upon the final decision to use only cast iron pipe for the purpose named.

Editor, SANITARY ENGINEER

You may recall that some months ago opposition developed in the Town of Burlington against the use of cast iron soil pipes beneath walls and buildings and in basements, the reasons advanced being that in Toronto and Hamilton glazed sewer pipes were permitted in basements and cellars, and what was good enough for Toronto and Hamilton was good enough for Burlington.

We enclose you herewith copy of a newspaper item that appeared about October 3rd in the "Burlington Gazette." It gives the views of a former citizen and ex-councillor of Burlington.

We immediately wrote the City Engineer of Glendale Cal., and the City Engineer of North Yakima, Wash., respecting the statements that appeared in the "Gazette." We enclose you copies of both replies. If you consider the matter of sufficient importance you are at liberty to publish the letters in whole or in part.

Very truly yours,
Chipman & Power,
Per Willis Chipman.

CLIPPING FROM THE "BURLINGTON GAZETTE"

Burlington, October 3rd, 1917.

Tile vs. Iron Pipe

"Mr. A. B. Cline, a former citizen and ex-councillor of Burlington, is in town on a visit from California. On speaking to him the Gazette man was asked what sort of a council we had in Burlington, anyway. Though absent for a number of years, Mr. Cline, through the Gazette has kept in touch with Burlington affairs. He informs us that when the sewer discussion of clay versus iron pipe was on he wished he had been in Burlington, as he had some first-hand knowledge on the subject. Just a year ago he saw them taking up iron pipes in the City of North Yakima, a city of 40,000 inhabitants, where pipes had only been down eleven years, and were being replaced with glazed tile. He says if anyone wishes iron sewer pipe, if they will go to Glendale, a city of 25,000, in Southern California, they can have all they want for carrying it away. This city just had iron pipe in ten years, when it had to be replaced with tile pipe."

20 Oct., 1917.

Willis Chipman,
c/o Chipman and Power, Civil Engineers,
Toronto, Ont.

Dear Sir:

Yours under date of October 15th, relative to removement of cast iron pipe in the City of Glendale, is before me.

Permit me to enlighten you as follows: the city of Glendale was incorporated eleven years ago. I have been City Engineer for the past ten years. The population of Glendale at the present time is approximately nine thousand people. However at the present time the sewer system in our town depends entirely upon cesspools, as we are situated immediately over a large gravel bed which makes this condition possible. We are at the present time working upon plans for a sewer system, which will be constructed with vitrified tile or possibly concrete pipe. The only cast iron pipe existing in the city of Glendale has just recently been installed by the municipal water department Possibly this pipe has been laid twenty months, surely no longer. I know of no iron pipe being used in the southern part of the state for sewage, except as house connections, where the universal practice throughout this part of the country calls for this class of pipe up to the lateral in the street; from there into the sewer proper they use tile or vitrified pipe. The only reason that cast iron pipe is not used, as I understand the situation, is owing to the greater expense of the cast iron pipe.

I do not know this A. B. Cline, but either he has been woefully misquoted or he had taken aboard a quantity of our famous California wines before he came back to your part of the country.

My business has been that of consulting engineer for the smaller cities for the southern part of the State. I am at the present time actively engaged in construction work, sewers excluded, throughout the southern two-fifths of the State. Such a condition as Mr. Cline described may have taken place without my knowledge, but I doubt it.

I have just called up the sewer department of the City of Los Angeles, and talked with the assistant to the chief of that department. He is also ignorant of any community who have removed any cast iron pipe.

Your ideas as expressed in your letter as to the usage of cast iron and tile pipes absolutely concur with the general practice in California.

Our yearly report has not been published as yet, and will not be for thirty days to come. I shall be glad to be of any service to you as I am always glad to put a damper on anybody misrepresenting a case, whether it be intentional or not.

Very truly yours,
Edward M. Lynch,
City Engineer, City of Glendale.

North Yakima, Wash., Nov. 20th, 1917.

Chipman & Power, Civil Engineers,
Toronto.

Your letters of Oct. 15th and Nov. 14th, in regard to replacement of iron pipe, were duly received.

I have delayed answering your first letter in order that I might interview Mr. A. B. Cline of this city in regard to the newspaper article referred to in your letters, and I, also, thought I might have him correct his statements regarding the removal of cast iron pipes.

A few days ago I saw Mr. A. B. Cline of this city, and find that the guilty A. B. Cline is his father who resides in California.

Mr. A. B. Cline's statement that iron pipes in North Yakima have been replaced with glazed tile is entirely erroneous. I have been in North Yakima for ten years, four years with the Street Car Company and six years as City Engineer. During that time I am sure that iron pipe has never been replaced with glazed tile or any pipe of that type. Cast iron water pipes have been replaced with larger cast iron water pipes, and wooden water pipes have been replaced with cast iron pipes, but I am sure that cast iron pipes have never been replaced with any other kind of pipes.

I try to keep myself informed as to the methods and requirements of other towns and cities in the state, and as a rule their requirements are the same as ours. Trunk sewers, sewer laterals and service connections up to two feet of the building line are required to be vitrified clay sewer pipe. Cast iron pipe is always required under buildings and to extend two feet beyond the outer wall.

I am mailing you our 1916 report. Our

(Continued on page 25)

New Canadian Patents

No. 178,468.

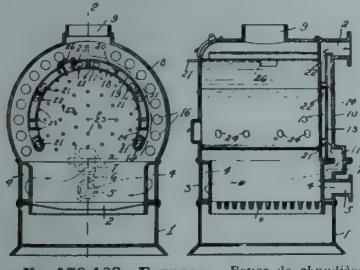
Eugene Solomon Manny, Montreal, Quebec, Canada, 31st July, 1917; 6 years. Filed 18th May, 1917. Receipt No. 279,870.

Claim.—1. A furnace of the character described comprising a firebox section, a dome-shaped section mounted thereupon, an arched member suspended within said dome-shaped section, said arched member comprising a plurality of sections, each section being divided into communicating compartments and water inlets and outlets communicating with said compartments, substantially as and for the purpose specified.

2. The combination with a furnace of the character described, comprising a firebox section having a channelway extending therearound, a dome-shaped section supported upon said firebox section, an arched member supported within said dome-shaped member, and means of communication between said arched member and the channelway within said firebox section substantially as and for the purpose specified.

3. In a furnace of the character described comprising a firebox section having an inlet channelway extending therearound, a top section supported upon said firebox section, a hollow wall secured to said top section and in communication with the channelway formed within said firebox section, an arched member suspended within said top section and means of communication between said arched member and said hollow wall, substantially as and for the purpose specified.

4. In a furnace of the character described comprising a firebox section, a dome-shaped section supported upon said firebox section, an arch suspended within said dome-shaped section, one wall of said arch having inlet and outchannelways formed therein, said arch section comprising a plurality of semi-



No. 178,468. Furnace. Foyer de chaudière.

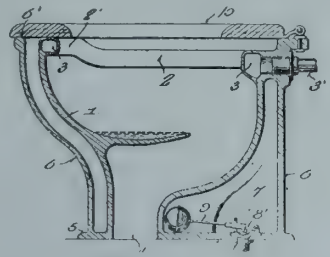
circular sections, said semicircular sections having passageways formed therein, and means of communication between said passageways and said channelways, substantially as and for the purpose specified.

5. In a furnace of the character described comprising a dome-shaped section, an arch member supported within said dome-shaped section, said arch member comprising a plurality of hollow sections, inlets and outlets communicating with said sections, some of said sections having a plurality of openings therein, and a valve controlled opening arranged within one of said sections, substantially as and for the purpose specified.

No. 177,992.

Anton Suelflohn, Milwaukee, Wisconsin, U.S.A., 3rd July, 1917; 6 years. Filed 10th April, 1917. Receipt No. 278,182.

Claim.—A device of the class described comprising a bowl having its front upper edge disposed in a plane above that of the main portion of said edge, a shell encasing the bowl and spaced from the wall thereof whereby to form an overflow chamber, the top of said chamber being open, the rear portion of said chamber being enlarged and having an outlet, the upper edge of said shell being in the same



No. 177,992. Lavatory Bowl.

substantially horizontal plane and coincident with the plane of the front upper edge of the bowl, a float operated valve in the outlet from said chamber, and a cover hinged to the shell and closing the open top of the chamber, said cover normally resting on the front upper edge of the bowl and the upper edge of the shell, the same forming a support therefor.

No. 177,687.

Robert Kerr, Winnipeg, Manitoba, Canada, 19th June, 1917; 6 years. Filed 25th September, 1916. Receipt No. 270,150.

Claim.—1. The combination with a water jacketed firebox, of a boiler having the rear end thereof mounted on the firebox and extending rearwardly over the greater part of the firebox and with the inner and outer walls of the firebox secured at the top of the sides of the boiler, and openings passing through the inner side walls of the boiler and forming a water connection between the water jacket and the interior of the boiler.

2. The combination with a water jacketed firebox, of a boiler mounted on the firebox and extending rearwardly the greater part of the length of the firebox and having the sides thereof permanently secured to the upper edges of the side walls of the firebox and fitted at each side with a series of openings communicating through the inner side walls of the firebox with the water jacket and on the under side with an

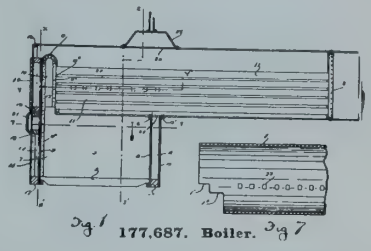


Fig 1 177,687. Boiler. Fig 7

opening communicating with the front portion of the water jacket.

3. The combination comprising a water jacketed firebox, and a boiler mounted on the firebox and extending rearwardly for the greater part of the length of the firebox and having the rear head plate thereof formed from a down turned extension of the rear inner end wall of the firebox, the down turned extension being connected to the said latter end wall by a short upwardly arched crown sheet.

4. In a boiler, a water jacketed firebox, a boiler mounted on the firebox and having the rear end thereof extending rearwardly for the greater part of the length of the firebox and having the interior thereof communicating at the sides through suitable openings provided with the water jacket and at the bottom through a suitable opening provided with the water jacket and the rear head thereof formed as a down turned extension of the rear inner end wall of the water jacket, and a suitably closed entrance opening passing through the water jacket and located directly opposite the rear head of the boiler.

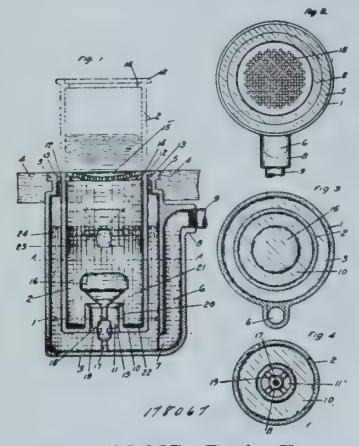
No. 178,067.

John Kirkwood, Lenox, Massachusetts, U.S.A., 10th July, 1917; 6 years. Filed 10th May, 1917. Receipt No. 279,592.

Claim.—1. In a device of the class described, a chamber having an inlet and an outlet, a separate removable chamber arranged within the outer chmber and having an inlet, and an outlet opening into the outer chamber, and a valve and a valve seat for controlling the outlet of the inner chamber, said valve having a stem extending through the bottom of the inner chamber of a proper length for engagement with the outer chamber when said chambers are fitted together, to raise the valve off the valve seat.

2. In a device of the class described, the combination with a fixed chamber having a bottom and side walls and an open end and a lateral outlet below the receiving end, of a separate removable chamber having a bottom and side walls and an open receiving end, and an outlet

through its bottom, said removable chamber being of smaller dimensions than the fixed chamber and adapted to be projected into and withdrawn from the fixed chamber, means for supporting the removable chamber within the fixed chamber above the bottom of the fixed cham-



No. 178,067. Drain Trap.

ber, and means for opening and closing the outlet in the removable chamber and including a valve having a depending stem projecting through said outlet in the bottom of the removable chamber, and an annular upright valve seat disposed around the outlet in said bottom and adapted to seat the valve, said valve stem being of a proper length to engage the bottom of the fixed chamber when said chambers are fitted together to raise the valve off its seat.

2. In a device of the class described, the combination of a fixed chamber having a lateral outlet, a separate removable chamber of less diameter than the fixed chamber and arranged within the fixed chamber to provide a space between the chambers, said removable chamber having an outlet arranged below the outlet of the fixed chamber and opening into said space between the chambers, and a valve adapted automatically to close the outlet in the removable chamber when the removable chamber is displaced upward from its normal position within the fixed chamber, and automatically to open said outlet when the removable chamber is restored to its normal position.

No. 178,001.

Howard H. York, Logansport, Indiana, U.S.A., 3rd July, 1917; 6 years, Filed 13th April, 1917. Receipt No. 278,334.

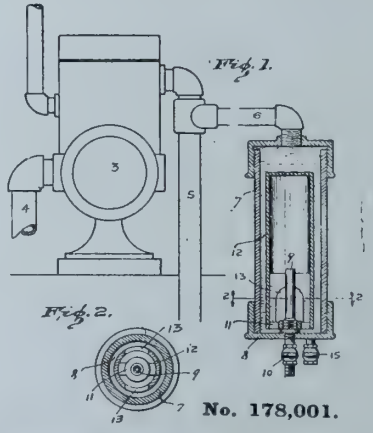
Claim.—1. The combination of a pipe conveying water under pressure, of a closed tank, a second pipe connecting the first pipe and tank, and an air chamber in the tank communicating at its lower portion with the interior of the tank and externally pressed by the water of the tank at all higher points.

2. The combination with a water service pipe, of a closed water tank having its interior in communication with the interior of the service pipe, and an air tank submerged in the water of the first tank and communicating with the latter at its lower portion.

3. The combination with a pipe containing water under pressure, of a closed tank, a second pipe connecting the interior of the first pipe with the interior of the tank and filling the closed tank with water, a second tank within the first tank air-tight except at openings through its lower portion, a stand pipe terminating at one end outside of the first tank and at its other end within the second tank above the highest opening in the second tank, said second tank containing air which is subjected to the direct pressure of the water in the tank, the water of the first tank entirely surrounding the second tank with a larger volume at the place of its water supply to regulate the temperature in the second tank.

4. The combination with a pipe containing water under pressure, of a closed tank, a second pipe connecting the interior of the first pipe with the interior of the tank and filling the closed tank with water, a second tank within the first tank air tight except at openings through its lower portion, a stand pipe terminating at one end outside of the first tank and its other end within the second tank above the highest opening in the second tank, said second tank containing air which is subjected to the direct pressure of the water in the tank, the water of the first tank entirely surrounding the second tank with a larger volume at the place of its water supply to regulate the temperature in the second tank, and means for regulating the amount of air in the second tank.

5. The combination with a water pipe, of a closed water tank having its interior in communication with the interior of the service pipe; an air tank submerged in the water of the first tank and connecting with the later at its lower por-



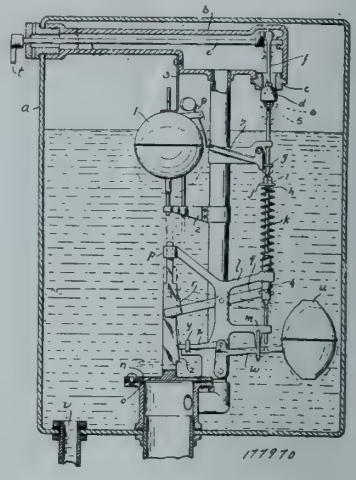
No. 178,001.

Water Submerged Air Chamber for Water Pipes.

tion, a stand pipe terminating at one end outside of the water tank and at its other end within the air tank above the highest opening thereto, and a cock to open and close the stand pipe.

Michael Mauer, Detroit, Michigan, U.S.A., 3rd July, 1917; 6 years. Filed 28th March, 1917. Receipt No. 277,-679.

Claim.—1. In a water tank, the combination of a container of air-tight construction, an air valve, a trigger for keeping the air valve open when the same has been opened, a discharge valve, connections between the air valve and the discharge valve so that when the air valve is opened the discharge valve is opened, a trigger device for keeping the



No. 177,970. Tank for Closets.

discharge valve open, a float which when dropped pulls the trigger out of engagement with the discharge valve and allows the descent of the same, and a second float provided with a trip lever which disengages the trigger from the air valve when the water rises in the tank.

2. In a tank, the combination of an air-tight container, an air valve, an intake pipe, a trigger for holding the air valve open, a discharge valve, means for opening the air valve and discharge valve, a trigger device for keeping the discharge valve open, a float whose dropping removes the trigger device and drops the discharge valve, a second float whose rise disengages the trigger from the air valve, and a spring for closing the same.

3. In a tank, an air-tight container, an air valve, a discharge valve, triggers for keeping each open, means for opening each and floats for closing each.

4. In a tank, an air-tight container, an air valve, a discharge valve, mechanism for opening each, means for keeping each open, and floats for operating said last-mentioned means for allowing the closure of each.

5. In a tank, an air-tight container, an air valve, a discharge valve, a vertical stem on each valve, means for opening the air valve, a pivoted crossbar for communicating the open movement of the air valve stem to the discharge valve stem, a suitably guided free link for engaging under a ratchet tooth on the discharge valve stem, a float for controlling the position of said tank, a trigger adapted to swing in a shoulder on the air valve stem, and second float provided with a hooked trip lever which rises with the rise of the water and pulls the trigger out from engagement with the shoulder of the fair valve stem.

SANITARY ENGINEER

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PUBLIC OWNERSHIP WORKMEN SLEEP

THE part which the technical and trade newspapers play in their particular fields is too often ignored by public officials and the action of the United States Senate Committee on Military Affairs in calling in Fred H. Colvin, editor of the technical newspaper, *The American Machinist,* to give evidence at the recent inquiry into the Government arsenals would indicate an awakening. THE FINANCIAL POST, under the heading "Public Ownership Workmen Sleep," says: The United States Senate Committee on Military Affairs was not satisfied with the way things were going on at the Government arsenals conducted under public ownership. They called in an expert, Fred H. Colvin, editor of the technical newspaper, *The American Machinist.* He gave some very interesting evidence. His evidence created a great sensation and is leading to a complete reorganization of the arsenals and the War Office officialdom responsible for conditions.

Mr. Colvin declared the Government arsenals at Springfield, Mass., and Rock Island, Ill., do not understand manufacturing principles and have antiquated machinery. Some of the machinery at the Springfield arsenal is fifty years old.

He charged that "an excessive nicety of requirement" in unimportant parts of rifles held up rifle production "tremendously."

The bayonet is only a butcher knife and a sixteenth of an inch would not make any difference," he said, "yet a variation of 1-2000 is sufficient cause for rejection."

"I have photographs taken of men in the Winchester factory playing checkers last August," he said further. "Details of manufacturing had not been decided upon by the War Department. The one great weakness was that everyone hesitated to take the responsibility in deciding these details."

"Were all the men playing checkers?" asked Senator Hitchcock, of Nebraska.

"No; some were sleeping," Mr. Colvin answered.

That the dilatory tactics of the Ordnance Department will prevent first delivery of the Browning machine guns until a full year after the entrance of the United States into the war was again emphasized by the next witness.

General Crozier, the United States Chief of Ordnance, gave orders that Mr. Colvin should be barred from inspecting arsenals because he insisted that expert machinists and not army officers should be in charge.

This experience shows what happens under public ownership. It also exposes the stupid antipathy that prevails among public officials against business and technical papers. Sir George Foster, Minister of Trade, voted to put Canadian technical newspapers out of business. Hon. Mr. Burrell, late Minister of Agriculture, supported a movement that would tax farm papers out of business. Even Mr. Murray, the Secretary of the Canadian Manufacturers' Association, after recommending every medium of publicity for Canadian manufacturers, from buttons to billboards, deliberately eliminated all reference to the business press.

When the manufacturers wanted to know how to make munitions it was not to the buttons or billboards but to the technical newspapers they applied. The Trade and Commerce department was helpless. The Manufacturers' Association did absolutely nothing for them. Not only did the newspaper, *Canadian Machinery,* show in a series of illustrated articles how to adapt Canadian plants for munitions but they secured the blue prints and specifications for French and Russian shells so that their readers could and did tender on them.

CAST IRON vs. CLAY TILE FOR HOUSE DRAINS

ON another page there appears an article under the above heading which deserves careful reading. The article is in the form of a number of letters that have passed between men whose sole interest in the matter is to guard the health, wealth and welfare generally of the public.

These men have reputations to lose; they are practical men who are in earnest when they undertake to give the public the best material. On the other hand what can we say or think of men who are not practical in the art of sanitary engineering, taking upon themselves the responsibility of making assertions that will not bear the light of day? It seems too bad that we have such men in our midst, but as it cannot be helped, we believe the best action that can be taken would be to live down the stigma placed upon the whole trade by such statements, and, like these civil and sanitary engineers referred to in the article, that still insist upon using the best material they know of for such purposes as referred to knowing full well that it takes time to prove all things that are right, when that time does come sanitary and heating engineers will have nothing whatever to be ashamed of.

Importance of Humidity to Health

Description of a Number of Humidifiers Different in Type to Those Already Dealt With—Moist Air or Water Vapor is of Greater Density—Systems Described Have Proved Their Efficiency

The humidifier last described in the preceding article was the well-known Hyge-Donor, an apparatus that can be attached directly to any heating furnace whether hot air, steam, hot water, etc. When adjusted the Hyge-Donor requires but little further attention. It is, however, not automatic, but from investigations made it appears to be working very satisfactorily. The amount of water has to be regulated depending on the way fires are kept. In a retort above the fire, water is heated to form steam or vapor and this vapor is circulated through the building to be humidified. It has been said that had there been any really dependable automatic devices for the control of humidifiers, much trouble would have been overcome.

There are, however, a number of "steam" humidifiers used in which water is supplied automatically. One of these is illustrated in Fig. 4. Its action will be readily realized by a study of the figure of the "Garrecht" furnace, designed only for hot air.

For some years Dr. P. H. Bryce, Chief Medical Health Officer of the Department of the Interior, has had installed in his own home a system of his own design (see Fig. 1) somewhat similar to that shown in Fig. 7 but applicable to any heating system. He also provides at the same time a means of bringing fresh warm air into the house. The Doctor's description of this novel yet simple plant is as follows:

"Various methods for maintaining humidity above fifty per cent. have been attempted, but that which has proved quite adequate is the following which may be attached to any hot air, hot water, or steam heater, (Fig. 2). It has for several winters been capable of automatically maintaining a relative humidity constantly of between fifty and fifty-five per cent.. The apparatus consists of (a) a hollow casting or a series of pipes coupled together and placed over the fire beneath the sections of the boiler with the inlet pipe attached to the public water supply through an ordinary closet tank, set in the cellar at such a level as to keep the heating reservoir filled. (b) —The exit pipe leads directly to the flower room or other convenient place in the house, where it delivers steam directly and through the law of expansion of gases diffuses itself throughout the house, so that everywhere the percentage of humidity is practically the same. The automatic character of the water supply regulates nicely the moisture in the house, because, if the weather outdoors is cold and dry, the amount of heat required is greater, the fire burns brighter and the evaporation is more; while, if the outer atmosphere be mild and consequently holds more moisture the fire will be burning less brightly and the amount of water evaporated will be proportionately lessened. It is desirable in order to make such a system effective that means be provided for introducing fresh air constantly into the house along with the moisture to maintain the sensation of freshness associated with moving air. It is found possible to warm outer air by passing it through a chamber in tubes which are surrounded by steam as it moves towards the flower room, since, as the air is warmed, its capacity for moisture increases, and when the two are mingled, they pass into the house atmosphere without any precipitation of moisture whatever.

To maintain the level of the water in the steam generating chamber 3 is considered important, and, to do this, a regulating tank 6 is introduced between the cistern 1 and the chamber 3; the pipe 7 leading from the bottom of the cistern and entering the tank 6 through the side wall near the top.

The pipe 7 enters the tank 6 and at the end has valve seat 8.

The float valve 9, having the face 10 engaging the seat 8, is preferably of rectangular form and is hinged to the bracket 11, extending outwardly from the side of tank 6 below pipe 7. The water line of the float 9 is on a level with the desired water level in tubular chamber 3. Therefore, the chamber 3, it is claimed, will always contain the exact quantity of water required.

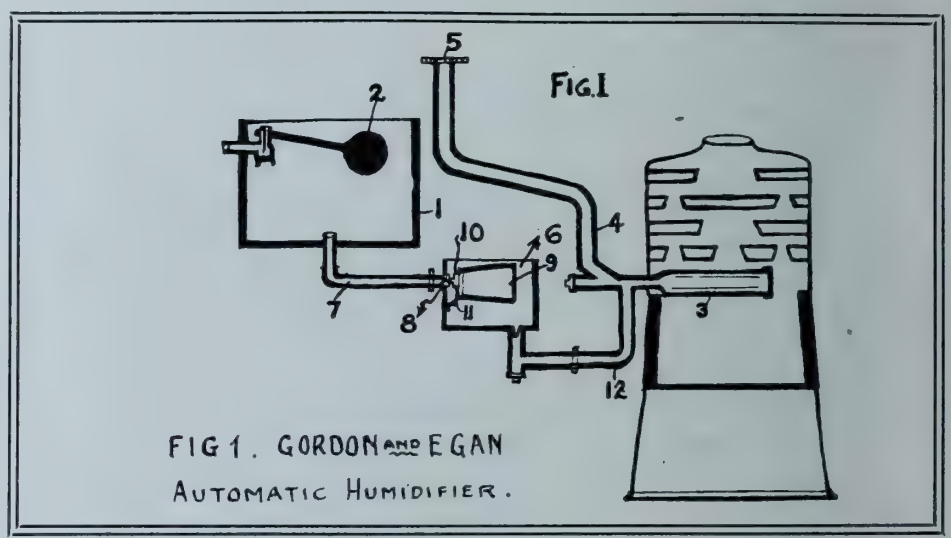


FIG 1. GORDON AND EGAN
AUTOMATIC HUMIDIFIER.

"Many minor details may be required according to the size of the house and the extent of the task to be performed, but the system is readily applicable both to large or small houses, and experience has shown that it will everywhere perform its work."

Gordon & Egan Automatic Humidifier

Figure 1 shows an automatic humidifier patented as to the means employed for maintaining the proper level of water in the vaporising receptacle.

Referring to the figure 1, 1 is the cistern, connected with a suitable water supply from the main water pipe, the ingress of the water being, controlled by the float operated valve 2. This cistern also acts as a settling tank.

The steam generating chamber 3 (or retort) of 1 inch pipe, which is situated in the furnace, contains the water which is vaporized and ascends in the form of steam through the pipe 4 to the outlet 5.

The tank 6 is connected to the chamber 3 by the pipe 12, which leads from the bottom of said tank 6 in U-shape to the direct channel to the chamber 3, passing the entrance to the steam pipe 4, the latter leading upwardly at an incline away from the generating chamber.

Explaining the apparatus in a general way, it may be pointed out that the cistern is connected to a supply of water under pressure and the water in the said system is maintained at a certain level. The water flows from the cistern into the regulating tank 6 and on into the chamber 3 which is situated in the furnace. As soon as the pre-determined level has been reached in the chamber 3, the float valve 9 closes the outlet from the pipe 7, and in fact shuts off the water from the cistern. As the water diminishes in the chamber 3, through the generation of the steam, discharged through the pipe 4, the float descends and allows a

fresh ingress of water from the cistern 1, thus automatically maintaining the level of the water in the chamber 3.

Instructions for installation are given by the manufacturers somewhat as follows:

First get the height of the steam generating chamber 3, where it comes out of the furnace. Place cistern 1 anywhere on the wall where it is easily accessible, the bottom to be 6 inches or less higher—just enough for the water to flow by gravity into the regulating tank 6. After being installed, the valve 8, which has a packing box, has also a tube inserted which can be unscrewed or screwed in to regulate the height of the water. Care should be taken if this is disturbed to tighten up the stuffing box or else the water will leak through instead of being prevented by the float valve packing 10.

Be sure to put the tight fitting covers on the cisterns, to keep out ashes or particles of any kind.

If the adjusting tube 8 requires to be altered and afterwards it should not face properly against the rubber seat, take a little off the rubber face with a file to suit the angle of the tube altered.

One should be sure that the generating chamber is level in the furnace, and if there is too much steam, shorten the generating chamber to suit. Three-eights of an inch height of water in the one inch pipe is what there should be to work properly. This can be seen by removing the one inch plug and holding something hard pressed against the opening of the Y-fitting.

Use pipe bend instead of elbows, and cover steam pipe 4 with asbestos covering. This pipe should have a good fall towards the furnace to take care of condensation.

To secure best results have the vapor opening 5 near the foot of the main stairs about 15 inches from the wall. Put it directly under the well opening thus allowing the moist air to rise to the upper flats more easily

The Buddington Automatic Humidifier

In a previous article there was described the Buddington Humidifier to be attached on top of the coils of either flat or round top radiators. Fig. 3 shows how humidifier can be adapted for hot air heating. When used on floor registers, two U-bar rails, on which the humidifier rests are furnished. When registers are placed in the side of the walls, the humidifier rests on brackets so placed that practically all of the hot air is driven up through the humidifier.

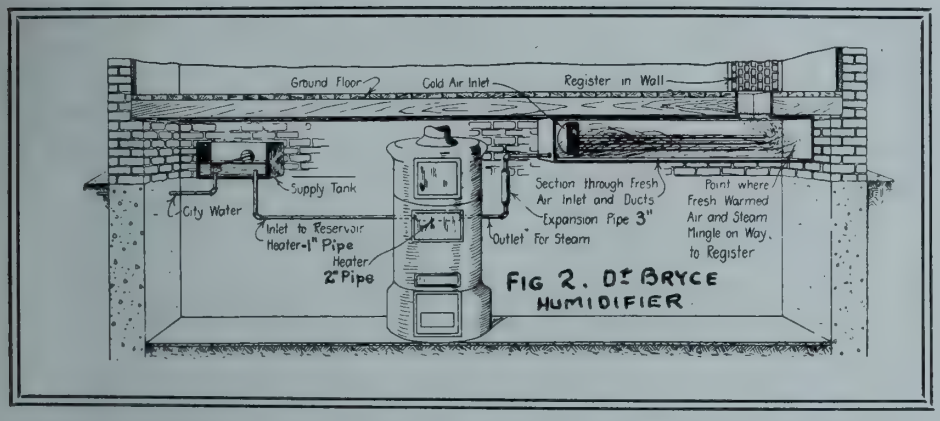


FIG 2. DE BRYCE HUMIDIFIER

But such humidifiers though easily filled with water are not automatic. Since these articles on humidity were commenced, there has been devised for hot air furnaces the Buddington Automatic Humidifier (see Fig. 4.).

It is claimed that one Buddington Automatic Humidifier will moisten the air in the entire house. It is connected to the city water supply, and automatically refills itself as the water is evaporated and sent in moisture to the various rooms, through the furnace pipes.

The claim is made that the Buddington Automatic Humidifier can be installed in practically any hot air furnace—new or old. It consists of a vitrified enamel evaporating pan, which rests on top of the dome over the fire box, where it gets the maximum heat. This is connected with a water pipe to the water chamber, which is suspended from the rafters, or placed on a suitable shelf outside the furnace. Inside of the chamber is a float valve, such as is used in the flushing chamber in bath rooms. The water level in this chamber and in the evaporating pan is always equal. As fast as the water evaporates from the evaporating pan, the float valve opens up and permits more water to enter.

The manufacturers make the following explanation as to why the humidifier is to be placed on the top of the fire box done:

"Many furnaces are equipped with a water pan, which is generally located down near the base. This is just as nonsensical as placing a tea kettle beside the stove and expecting to have steam issue from the spout. To be sure, the water will evaporate in time, but the process is far too slow to combat with the intense dryness of artificial heat. That is why Buddington Humidifiers are placed on top of the fire box dome, over the heat."

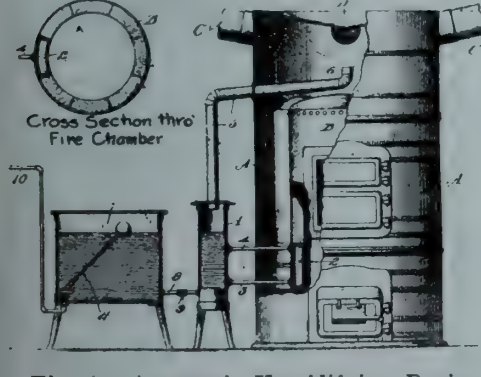


Fig. 4.—Automatic Humidifying Device (Hot Air Heating).

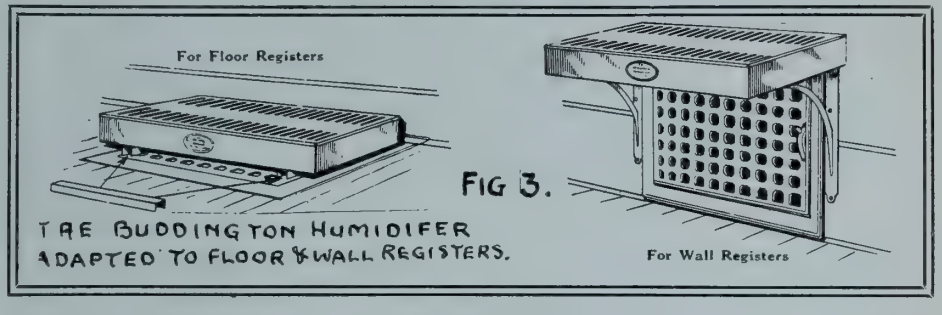


FIG 3. THE BUDDINGTON HUMIDIFER ADAPTED TO FLOOR & WALL REGISTERS.

In an Arkansas River town built largely on reclaimed land most of the houses had to be built on pillars four or five feet above ground. One resident with a longer head than his neighbors, inclosed the space under his house with pickets and in the pen thus made kept his drove of scrawny hogs.

"Do you think it is sanitary—healthful—to keep your hogs under the house like that?" he was asked.

"Aw, I do' know, stranger. I reckon so," replied the native, and hitched up his overalls.

"Never notice any bad effects from it?"

"Why, no," he drawled. "I been a-keepin' my hawgs there for fourteen years, an' never lost a hawg."

WORKINGMEN BUILD HOMES

Though the total value of the permits issued for buildings in Toronto during 1917 is much lower than for 1916, which year included the $3,000,000 Union Station, there has been a notable increase in the number of buildings erected and the number of permits issued, indicating that more workingmen's homes are going up.

The following is a comparative statement of building permits issued by the City Architect during the years 1916 and 1917:

	1916.	1917.
Approximate value of building permits issued in year	$9 882.477	$7,163,556
Approximate value of building permits issues in Dec.	3,428,848	370,358
Number of permits issued for year	3,976	4,448
Number of permits issued in December	315	214
Number of buildings erected in year	4,753	5,391

Market Conditions and Tendencies

Statements Regarding the Prices and Trend of Supplies.

THE MARKETS AT A GLANCE

TWO changes of importance were recorded in the price of commodities in which the plumbing trade is interested. There has been a readjustment in price on some sizes of wrought iron pipe with a substantial advance in the price of one-eighth inch size. Manufacturers of wrought iron pipe are now in a better position so far as getting raw materials is concerned and operations are proceeding more smoothly. The increase in freight rates will have an effect on the price outside the regular delivery points.

Flat rim sinks have registered a considerable decline in price, amounting to $1.55 in one instance. On some plumbing lines there has been inquiry for quotations recently which is apparently for projected work. As yet there has not been very much booking on soil pipe and fittings. This is the usual time of year when booking is done, but dealers anticipate that better results will be in evidence in the near future as it is a little early yet to expect any substantial orders being placed.

In the ingot metals lead shows a measure of firmness, evidenced by an advance of one-quarter cent per pound in the primary market by the largest producer in the United States. Tin is still in a strong position in the local market as stocks are light and there is no assurance that additional supplies will come forward in increased volume. There was a big drop in price in the London market during the time since last issue, due to the rumor that heavy stocks of tin were afloat and were likely to reach the distributing centres in the near future. Prices in the primary market have within the past few days taken on a measure of firmness again. Stock-taking on the part of plumbing supply houses is now about completed and affairs will soon be in shape for the new year's trade.

TORONTO, Jan. 14.—For the most part wholesale houses have been devoting their energies to stock-taking during the opening days of the new year. It is somewhat early yet to expect any extensive booking for spring delivery as projected buildings have not yet reached the stage where supplies will be secured for their erection. There is a considerable number of small jobs under way that require materials, but larger works are scarce at this season of the year. Wholesale houses are looking forward with confidence to the coming year.

Sheet Steel To Be Further Restricted

RANGE BOILERS.—In the face of the tight situation for raw materials there has been no inclination to change the price on range boilers. Heavy sheets that are used in the ends of the boilers cannot be brought in under any condition as there is an embargo on their shipment by the United States Government. It is furthermore intimated that the lighter steel sheets for Canada which will be allowed to come forward will be restricted to 50 per cent. of requirements. This will make the situation all the more difficult.

	Standard	Extra Heavy
30-gallon range boilers....	$13.00	$17.00
35-gallon	17.00	20.50
40-gallon	20.50	24.00
52-gallon	28.00	32.00

Flat Rim Sinks Register Decline

ENAMELWARE.—A decline in price of $1.55 on the 16x24 in. flat rim sink and $1.10 on the 18x30 in. size has been recorded during the week. The price on the 18x30 is $5.50 each. Other lines of enamelware hold unchanged. Manufacturers are fairly well supplied with raw materials and have not had any difficulty in this connection recently. Business is not heavy at this season of the year, which is a reasonable condition.

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Sinks, roll rim, 18 x 30 in., staple.....	16 80
Closets, oak tank and seat	22 00
Do., enamel iron or white vitro tank...	23 75

Early Yet For Any Considerable Booking

SOIL PIPE FITTINGS.—It is now approaching the season of the year when manufacturers of soil pipe and fittings expect that booking will be done against spring orders. It it early yet, of course, so soon after the turn of the new year. There is an optimistic spirit prevalent and the next few weeks may show the justification for this feeling. Prices hold unchanged since last issue.

SOIL PIPE FITTINGS.

Medium and extra heavy soil pipe, 6-inch and under	35%	2½%
8-inch soil pipe	....	30%
Medium and extra heavy fittings, and under	40%	2½%

C. I. PIPE FITTINGS.

Cast iron fittings	....	15%
Cast elbows, tees, etc.	....	15%
Plugs	....	30%
Bushings	30%	33⅓%
Flange unions, standard	....	20%
Dart unions, ¼-inch to 2-inch.....	20%	25%
Do., 4½ in. and larger	....	15%
Nipples, up to 4-inch	....	45%
Do., 4½-inch and larger	....	40%
Do., running thread 4-in. and under	....	25%
Couplings, 4-in. and under	....	35%
Do., 4½ in. and larger	....	15%

MALLEABLE FITTINGS.

	Black	Galv.
Malleable Fittings, Class A, lb.....	0 50	0 63
Do., Class B, lb. net.....	0 22	0 33
Do., Class C, lb. net.....	0 15	0 22

Valves Hold Steady; Business Still Good

VALVES.—Manufacturers are still kept busy with orders that are before them. With the approach of spring and the greater activity in shipbuilding there should be even an acceleration in this respect. At the present time there is a heavy demand for marine oakum which indicates that there will be extensive operations carried out during the coming year. Prices were unchanged during the week.

	Discount off list
Ground work	50
Compression work, standard	52
High grade	45
Cushion work	46
Fuller work, standard	50
High grade	43
Basin cocks, No. 0 standard	46
Nos. 1 and 2	46
Bath cocks	53
Flatway stop and waste cocks, standard.	53
High grade	50
Roundway stop and waste cocks, standard	53
High grade	50
Brass steam cocks, standard.....	Net
Globe, angle and check valves, standard.	10
High grade	7½
Radiator valves, standard	15
High grade	10
Patent quick opening valves	35
Basin Cocks—	
No. 0 and 1, Fuller pattern	50
No. 0 and 1, compression	46
Midget	50
Globe, angle and check valves, medium pressure	30
Radiator valves, standard	30
Radiator valves, Jenkins disc	30
Radiator valves, quick opening	40

Marine Oakum In Excellent Demand

OAKUM.—Dealers in oakum report the demand for marine oakum at the present time is excellent. They take this as

a sign that there will be great activity in shipbuilding during the present year and that ship contractors are anticipating their needs. There is a possibility that the United States may place an embargo on the shipment of oakum from that country. Should this occur there would in all probability be none obtainable except where it was shown that it is to be used in the construction of ships or put to other use that will further the war-time activities. Plumbers' spun oakum is in light demand at this season of the year.

		Per 100 lbs.
Best American	....	$21.50
U.S. Navy unspun	....	20.75
Plumbers' spun	$8.50	10.00

Canada Can Only Get 50% Of Requirements

SHEETS, PLATES. — Advice has reached some of the local dealers that the United States government intends to allow only 50 per cent. of requirements to come forward to Canada on sheet steel. This will place existing stocks already in this country in a strong situation. Intimations were made last week that 3/16-inch plate and ¼-inch plate were likely to advance but on further consideration of the matter dealers decided that since existing stocks were so light there was very little object in disturbing prices at present. Prices of black sheets and galvanized sheets held unchanged during the week.

BLACK SHEETS—		Per 100 lbs.	
10 gauge	....	$12 00	$12 00
12 gauge	7 55	11 60	11 60
14 gauge	7 45	9 90	11 65
16 gauge	7 50	10 00	11 75
18-20 gauge	7 30	8 30	10 80
22-24 gauge	7 35	8 35	10 85
26 gauge	7 40	8 40	10 90
28 gauge	7 50	8 50	11 00
3-16-inch plate	12 25	....	.....
¼-inch boiler plate	12 00	....	.....
GALVANIZED SHEETS—			
10¾ oz.	$ 9 50	$10 00	$12 00
U.S. 28	9 20	9 70	11 70
U.S. 26	8 90	9 40	11 40
22 and 24	8 75	9 25	11 25
18 and 20	8 60	9 10	11 10
16	8 45	8 95	10 95
14	8 35	8 85	10 85

Corrugated Sheets Hold In Steady Market

CORRUGATED SHEETS. — Quiet prevails in the market for corrugated sheets, eavetrough and conductor pipe. This is the season of the year when dealers do not anticipate very heavy business. Recent severe weather has had a tendency to slow up any building that may have been in progress. Prices hold unchanged.

	Per 100 Sq. Feet Galvanized	Painted
No. 28 gauge	$ 8 70-$ 9 00	$ 8 00
No. 26 gauge	9 60- 10 00	9 25
No. 24 gauge	15 00-	12 00
No. 22 gauge	18 00-	15 25
No. 20 gauge	21 00-	18 50
No. 18 gauge	27 00-	24 00

No Hardship As Yet Through Permit System

BOILER TUBES.—Dealers in boiler tubes have so far been able to secure permits for sales of boiler tubes where it has been shown that the industry for which they were intended was necessary to the country's welfare at this time. The instance of the coal company cited last week, which company was badly in need of boiler tubes to make repairs on their hoisting machinery boiler, has been solved through the granting of the permit by the Dominion Government. Stocks of tubes, however, are within very narrow compass.

Toronto—	Per 100 feet Cold drawn	Lapweld
1 inch	$36 00	$ ....
1¼ inch	40 00	....
1½ inch	43 00	36 00
1¾ inch	43 00	36 00
2 inch	50 00	36 00
2¼ inch	53 00	38 50
2½ inch	55 00	42 00
3 inch	64 00	50 00
3¼ inch	....	58 00
3½ inch	77 00	60 00
4 inch	90 00	75 00

NEW LISTS ISSUED ON WROUGHT IRON PIPE.

Toronto.

WROUGHT PIPE.—Manufacturers of wrought iron pipe have issued new lists and discounts, but the result of the change does not show much material difference in the net prices prevailing previously. A readjustment has been made in a few sizes.

The only changes over the previous list are an increase of $1 on ⅛-inch standard buttweld black, and an increase of $1.50 in galvanized standard buttweld of same size. Black ¼-inch and ⅜-inch standard buttweld have been reduced 2c per 100 feet, while the galvanized on same sizes has been advanced 7c per 100 feet. Following are the new prices:

	Per 100 Feet Black	Galvanized
Standard Buttweld—		
⅛ in.	$ 6 00	$ 8 00
¼ in.	5 10	7 23
⅜ in.	5 10	7 23
½ in.	6 46	8 03
¾ in.	8 17	10 29
1 in.	12 07	15 22
1¼ in.	16 33	20 59
1½ in.	19 53	24 61
2 in.	26 27	33 12
2½ in.	42 12	52 94
3 in.	55 08	69 23
3½ in.	69 92	86 94
4 in.	82 84	103 00
Standard Lapweld—		
2 in.	29 43	35 71
2½ in.	43 88	54 11
3 in.	57 38	70 76
3½ in.	71 76	89 70
4 in.	85 02	106 28
4½ in.	96 52	121 29
5 in.	112 50	141 34
6 in.	145 90	183 36
7 in.	190 40	238 00
8 L in.	200 00	250 00
8 in.	230 40	288 00
9 in.	276 00	345 00
10 L in.	256 00	320 00
10 in.	329 60	412 00

Prices Ontario, Quebec and Maritime Provinces.

Lead Products Were In Steady Market

LEAD AND ZINC PRODUCTS.—Despite a decline in the London tin market reported last week the local situation has shown no change so far as products manufactured partially from tin are concerned. In the primary market pig lead held in a fairly steady position and a change cannot be anticipated from that quarter immediately at any rate. Prices held unchanged. Demand is fair.

Lead pipe, lb.	0 14	....
Lead waste pipe, lb.	0 15	....
Lead traps and bends	Net list	
Lead wool, lb.		0 16
Lead sheets, 3 to 3½ lbs. sq ft., lb.		0 13¼
Lead sheets, 4 to 8 lbs. sq. ft.		0 12½
Cut sheets, ¾c lb. extra, and cut sheets to size, 1c lb. extra.		
Solder, guaranteed, lb.	0 42½	....
Solder, strictly, lb.	0 39½	....
Solder, commercial, lb.	0 36¼	....
Solder, wiping, lb.	0 38½	....
Solder, wire, lb.	0 45	....
Zinc sheets, per lb.	0 26	

Stagnant Market In Old Materials

OLD MATERIALS.—There is a continuation of the dull condition in the old material market. Buyers and sellers are apparently at loggerheads and there seems no immediate prospect of a change in the situation until something more definite materializes with respect to the fixing of prices on these materials in the United States.

Tea lead	$ 0 04½	....
Heavy lead pipe	0 06	....
Yellow brass	0 12	0 13
Red brass	0 20	....
Light brass	0 09	....
Heavy zinc	0 05½	0 06
Heavy copper	0 20	0 21
Stove plate, per ton	17.00	18.00
Old rubber boots and shoes	....	0 08
Old cast iron, per ton	23 50	25 00
Overshoes, trimmed Arctics	....	0.06¼
Auto tires	0 04¼	....
Bicycle tires	0.03½	.....
	Per gross ton.	
No. 1 railroad wrought	....	22 00
No. 2 railroad wrought	9 50	10 00
Pipes and flues	....	12 00
No. 1 busheling	16 00	17 00
No. 2 busheling	....	12 00
Country mixed scrap	14 00	15 00
Country No. 1 wrought iron	....	18 00

Tin Maintains Steadiness In Market

INGOT METALS.—There was a steadiness in the market for ingot metals during the week, with a fair demand reported. Tin stocks are comparatively light in this market, and prices were maintained at the same figure as last week, in spite of fluctuations in the primary market at London.

COPPER.—The exports of copper from the United States during 1917 amounted to 1,100,000,000 tons. This exceeded by 25 per cent. the previous record year of 1913. It is estimated that 75 per cent. of the copper produced is now being used for war work either on this continent or abroad. When the war ends there will have to be a very great readjustment. In the local market there was a steadiness of tone, prices being quoted at 30c to 32c for casting copper.

TIN.—There was a slight recovery in the London market during the week, the recent big decline having been attributed to the liquidation of limited speculative accounts, with buyers shy. Futures declined more heavily than spot tin in that market, and it may be that heavier stocks of tin are en route from the East Indies than estimated. One local metal concern stated they had received advices that it is believed five ships are due to bring stocks of tin into the London market. If they arrive safely it may mean that the stocks will be sufficiently heavy to break the market considerably. In the local market supplies are not heavy and quotations held unchanged at 78c to 80c per pound. Later advices regarding the shipment of Singapore tin into the United States direct without license show that the permit system still prevails.

SPELTER.—Producers of spelter in the United States are of the opinion that production has now been brought down

(Continued on page 25)



INCORPORATIONS

Cotter Bros. Limited of Winnipeg, have been incorporated—plumbers and steamfitters—Capital stock $50,000.

OBITUARY

Regina, Sask.—Digby A. Smith, of Potts & Smith, Ltd., plumbers, is dead.

John M. Park, member of the boilermaking firm of Park Brothers, and one of Chatham's most prominent business men, died recently at his home on Queen Street, Chatham, Ont. He was 57 years of age.

MUNICIPAL NOTES

Belleville, Ont.—The Town Council contemplate the installation of an electric pump.

Renfrew, Ont.—The Town Council contemplate the purchase of pumps for the waterworks.

Brantford, Ont.—The Town Council has passed the following by-law: $100,000 for waterworks improvements.

Whitby, Ont.—The following by-laws have been passed by the Town Council: $1,150 for construction of sewer laterals; $3,200 for low level pumping station; $5,700 for extension waterworks and electric light.

Perth, Ont.—The municipality propose to raise $120,000 by municipal debentures and to purchase the local electric and waterworks plant from the present owners, the Canadian Electric and Water Power Co.

PLUMBERS GET INCREASE

The journeymen plumbers of Halifax, N.S., have been granted an increase in pay to 45 cents per hour voluntarily by their employers. At the time of the explosion negotiations were pending and it was expected that the increase would become effective on January 1. Recent conditions in Halifax prompted employers to voluntarily put the new scale in force immediately and this course has been followed generally. Fifteen journeymen plumbers from St. John have commenced work in Halifax with the different master plumbers.

GOVERNMENT SANCTIONS WATERWORKS

Windsor, Ont.—Representing the Canadian Steel Corporation, Mr. O. E. Fleming, K.C., at a meeting of the Border Utilities Commission, held recently, made an announcement that official Governmental sanction had been received for a new water works system to serve the Town of Ojibway, where the Canadian Steel Corporation is engaged in the construction of a large steel plant. The plans for the water works system were submitted some time ago, Mr. Fleming stated. An intake pipe to be laid 250 feet out into the Detroit River will bring the water to the pumping and chlorination station for distribution.

PERMISSION TO LAY MAINS

Toronto, Ont.—The Ontario Railway and Municipal Board has approved of the by-law of the Township of York with regard to an application to lay water mains on four streets These mains will be laid on Rogers road, Lambton avenue, Dufferin street and St. John's road, and will be 12-inch size. They will connect with the city waterworks system, and the city is supplying the water, as agreed by contract.

N.Y. WATER MAINS BURST

Considerable commotion was caused in the New York waterworks system recently when two water mains burst while firemen were fighting two big fires. The bursting of the mains on 11th and 12th street flooded an area covering many blocks. Geysers shot 30 feet into the air and it was very difficult to stop the flow owing to the fact that the water was running at high pressure because of the fires. A lake of water 18 inches deep soon formed and was solidly frozen in the low temperature.

WATERWORKS FOR OJIBWAY

Plans for a waterworks system to serve Ojibway, where the Canadian Steel Corporation is building a $40,000,000 plant, have been approved by the Ontario Health Department. The Federal Government will be asked to allow the intake pipe to be laid 250 feet into Detroit River opposite the new harbor now being built.

WATER MAIN BURST

A ten inch main near the tank of the Shelburne waterworks, Shelburne, Ont., burst recently and since that time the water takers in the northern part of the village have been without water. An extra length of pipe had to be ordered from Toronto owing to some neglect in not having this size in stock locally.

PLUMBING AND PROFANITY

In his defence for uttering what was alleged to be an almost continuous flow of profanity on Christmas Day, Frank McCarron through counsel, pleaded provocation before the Toronto police court. The water pipes in his domicile had frozen, he said, and the language which flowed for a few hours following the disruption of the plumbing system, was, in his estimation, justifiable. The magistrate thought otherwise and assessed him $5 and costs.

CONSTRUCT SANITARY SEWER

The council of the corporation of Thorold, Ont., contemplates the construction of a sanitary sewer with necessary laterals on McArthur lane, from a connection with the present sewer on the east side of Front Street easterly 253 feet.

TOWNSHIPS WANT WATER THROUGH CITY PIPES

The townships of Scarborough and Etobicoke are seeking to make an agreement with the city of Toronto with a view to getting a water supply for certain sections of these townships. An application has been made to the Legislature for power, in the event of their failing to get terms from the city, to have the Ontario Railway and Municipal Board fix the conditions and terms. The townships want to assess the cost for the construction of the system.

WATER WASTE INVOLVES COAL AND ELECTRICITY

A considerable increase in the amount of water pumped by the Toronto waterworks since the commencement of cold weather indicates a considerable waste in the city. On a recent day the waterworks pumped a total of 65,000,000 imperial gallons, or 135 gallons for every man, woman and child in the city. This amount equals that pumped on the hottest summer day. This water is pumped by coal-generated steam and electricity and both coal and electricity are scarce at the present time. Any waste of water, therefore, is also a waste of coal and electricity. Many citizens doubtless let their taps run in the cold weather to avoid freezing. It has been pointed out that the more efficient and effective way to stop freezing is to shut the water off in the basement of the house and let the taps drain.

MARKET CONDITIONS AND TENDENCIES

(Continued from page 23)

to the level of current requirements. Producers are carrying large stocks, but are not disposed to force sales in view of the fact that reduction in output has been effected. There was a better demand in the local market, with quotations made on the basis of 9¾c to 10½c per pound.

LEAD.—In the New York market the largest producer of lead advanced the price of lead ¼c per pound during the week. In that market lead has been regarded as in fairly strong position. Offerings of several cars in that market during the week did not find keen buyers. The local situation remained unchanged, the price quoted being on the basis of 8¾c to 9c per pound.

ANTIMONY.—The United States Government is reported to be in the market for two or three hundred tons of spelter, and in the face of the dullness in the primary market it is expected there will be keen competition for this business. Prices in the local market held unchanged at 16c to 18c per pound.

ALUMINUM.—Quotations held steady and unchanged at 60c per pound. Demand is only fair at this season.

PIG IRON.—Some of the Canadian producers of foundry iron are still in a favorable position to take business for this commodity for nearby shipment. As stated last week, one of the big producers has been forced to close the foundry iron furnace and to devote all their energies and fuel supplies to the production of steel. Quotations held unchanged at $50 per ton.

CLAY TILE VS. CAST IRON HOUSE DRAINS

(Continued from page 16)

report for 1917 will not be ready for some months.

Yous truly,
N. A. Gilman,
City Engineer.

It will be plainly seen that it requires practical men to guard against being swayed by the opinion of unpractical men, because of the fact that the latter not only make statements that are untrue and unpractical, but also cast reflections upon the abilities of men of experience.

One regrettable feature in connection with this matter is that the "Burlington Gazette" knows better, and should not have given publicity to such a wild statement.

One thing is certain, that if the people of Burlington were the subjects of as much trouble with blocked drains, broken tile pipe and mutilated lawns as is Toronto, no such statements as Mr. Cline is reported to have made would be tolerated even by as well-meaning a local newspaper as the "Burlington Gazette."

DO IT NOW

Appreciate Your Friends Now or You May Live to Regret It

Around the corner I have a friend,
In this great city that has no end;
Yet days go by and weeks rush on,
And I never see my old friend's face;
For life is a swift and terrible race.
He knows I like him just as well
As in the days when I rang his bell
And he rang mine. We were younger then;
And now we are busy, tired men—
Tired with playing and strenuous game;
Tired with trying to make a name.
"To-morrow," I say, "I'll call on Jim,
Just to show that I'm still thinking of him,"
But to-morrow comes and to-morrow goes,
And the distance between us grows and grows.

Around the corner!—Yet miles away
"Here's a telegram, Sir," Jim died to-day!
And that's what we get—and deserve in the end—
Around the corner, a vanished friend.

C. H. Towne.

Toronto.—The Cluff Ammunition Co. have started rebuilding operations at the plant which was recently destroyed by fire.



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CHARTERED AS AN EDUCATIONAL INSTITUTION IN 1897

December 14, 1917.

Mr. Edwin Newsome,
Editor, Sanitary Engineer,
143 University Ave.,
Toronto, Cnt., Canada.

Dear Mr. Newsome:

I am glad to tell you the "Sanitary Engineer" reaches me regularly now. Accept my best thanks for same. I sure did miss the back numbers, for your publication is indispensable to me.

As you are well aware, Mr. Newsome, there are countless masters who say they are too busy to read. You know the type - they imagine they are the busiest fellows in town. But they often get "stuck on a job" and although too busy to read your journal, they are the first to write you for information whenever they are in trouble, and this is often.

Frankly, I am not in the habit of throwing bouquets, but I can conscientiously say, your paper is the livest I have ever read in any country, and as a concrete example of my appreciation, I am sending you under separate cover an article on the latest approved method of executing plumbing in the United States.

Hoping that it will interest your readers, and wishing you continued success in the real good work you are doing for the entire fraternity, I am,

Very sincerely yours,

Arthur Bateman

AB:MA. Head Sanitary Department.

The above testimonial is just one of the many we receive from time to time. But we particularly value this one because of the fact that it comes from a man who has the real welfare of the sanitary and heating engineering trade at heart. Professor Bateman has had a practical training, and has risen from the ranks to the position he now holds; and still with all his training, he finds that SANITARY ENGINEER is indispensable.

PRACTICAL SHEET-METAL WORK

THREE PIECE ELBOW WITH GUSSET OR GORE PIECE.

BY THOMAS STANFIELD

THE next few problems to follow in this series will be in the nature of general sheet metal work, the one to be described in this issue being that of a gasoline tank for a motor boat, although the practice of inserting baffles in any kind of oil tank that has to be fastened on a moving vehicle is also good.

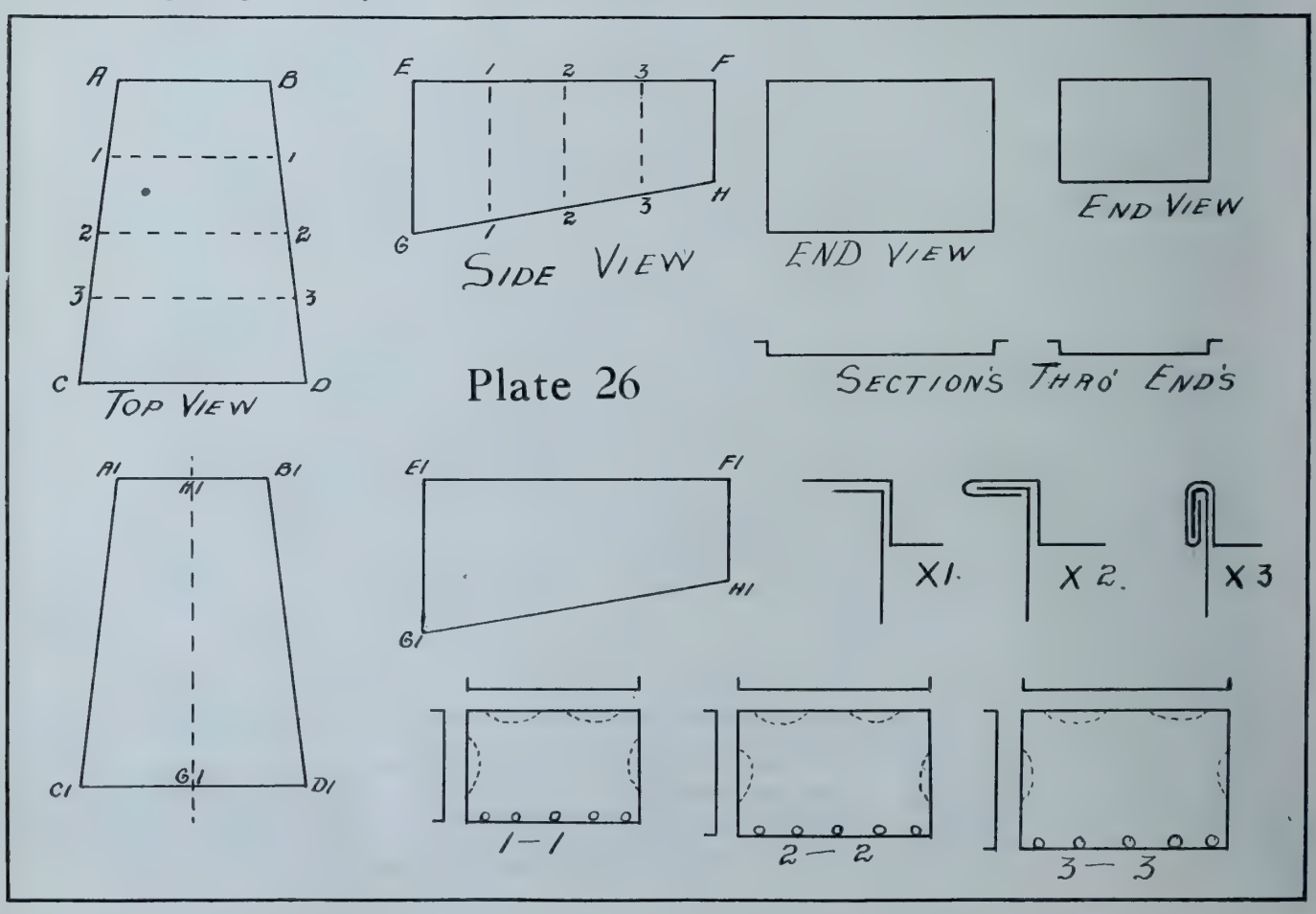
As a small leak would cause considerable trouble, the tinsmith in making a tank must exercise great care. The tank as shown here is of a fairly regular pattern or design, yet in some instances the nature of the space in which the tank is located requires a very irregular shaped tank.

In the top view or plan, the three dotted lines 1-1, 2-2 and 3-3 show the position of the plates or partitions usually put in to keep the contents of the tank from splashing too freely in the tank, through the motion of the boat, thus putting too much strain on the joints and seams of the tank.

In the development of the patterns it is necessary to have a plan or top view and side view. In this case let A, B, C, D be the outline of the top view and E, F, G. H the outline of the side view. The top of the tank being square with both ends, the top view is also the outline of pattern of top section. The line G H inside gives the length of bottom section. Draw a line as at G 1 and H 1 and square from this line. At these points draw lines on both sides and at one end G 1. Mark on each side half the distance from C to D. At H 1 mark on each side half the distance from A to B. Connect the points thus obtained forming outline A1, B1, C1 and D1, being pattern of bottom.

The length of side is shown by lines A C and B D of top view. Draw a line as E1—F1 equal in length to C A in top view. Draw lines at right angles to E1 and F1. On line drawn from F1, mark off a distance equal to E G on side view. From F1 mark off the distance from F to H in side view. Connect points G1 and H1, thus obtained, completing pattern of side. The two end pieces are square or rectangular pieces as shown in the two end views. The section through ends show edges turned on end pieces. At X1, X2 and X3 are shown the three operations in fitting on end pieces. This seam is doubled over from the outside, making the ends very secure. At 1-1, 2-2 and 3-3 are shown the three portions which are put in before ends are seamed on. These are either punched or cut out as indicated by dotted lines.

(Continued in next issue.)





Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

WINDMILLS AS A POWER

Editor Sanitary Engineer.—Some time ago I read an article which showed how one of your subscribers was doing a nice business by selling and installing windmills. I found on investigating that your subscriber was not a full-fledged sanitary engineer but was really doing plumbing as a side line. However, no doubt, if he perseveres and puts some real study into the sanitary engineering part of his business, no doubt he will like most of us, become proficient. But the problem that most interests me is this: If an ordinary mechanic, or a man with at least some mechanical turn of mind can make a success in selling windmills for pumping, there can be no question but that a fully trained sanitary and heating engineer can be much more sucessful, because he has received a really better training from the ground up.

With these thoughts in mind, I wish to ask you a few questions regarding windmills and the work that can be expected of them. I come from the motherland, and it seems to me I heard that windmills could be used for a number of things. I have in my mind the old four-sail miller's mill that would grind wheat into flour, turning, I should imagine, stones weighing several tons. But in this country the windmill appears to be only used for pumping water. Here are a number of questions I would like you to enlighten me upon.

Are there any tables showing the power that can be developed with a windwindmill?

The number of gallons that certain sizes of windmills can be expected to deliver when in operation?

Can a windmill such as is used for pumping water, be used to compress water into a pneumatic tank or, would it be possible to procure a larger windmill that would develop enough power to run an electric dynamo?

Any other information about the possibilities of using wind as a power, will be appreciated by—

A. R. R.,
Country Sanitary Engineer.

Without any unnecessary comments regarding the first part of A. R. R.'s letter, we purpose showing that this question of utilizing wind as a power in rural districts at least is a very important one.

We in Canada have a large rural population, and the more we can keep the balance of rural residents on the biggest side, the better it will be for Canada and Canadians, and no doubt if we try and adapt all the sources of

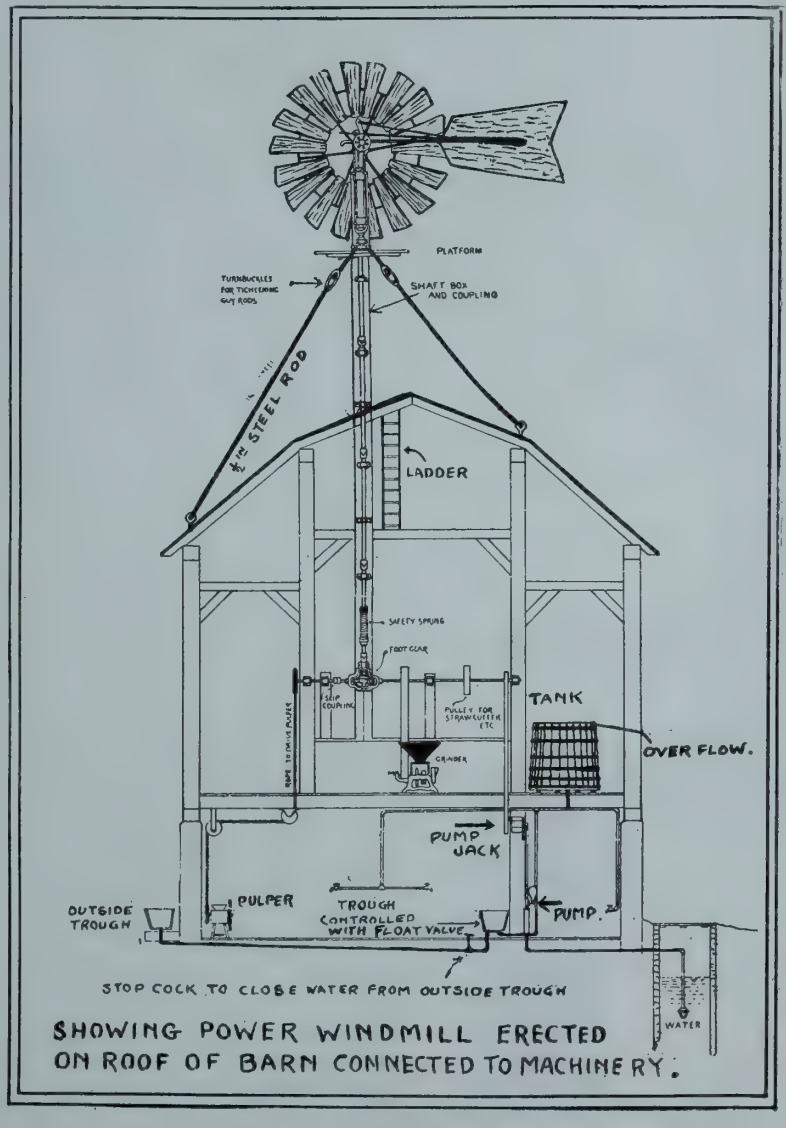


Fig III.—A type which will develop abo ut one horse power or so.

power we have at our disposal we as a whole will benefit therefrom.

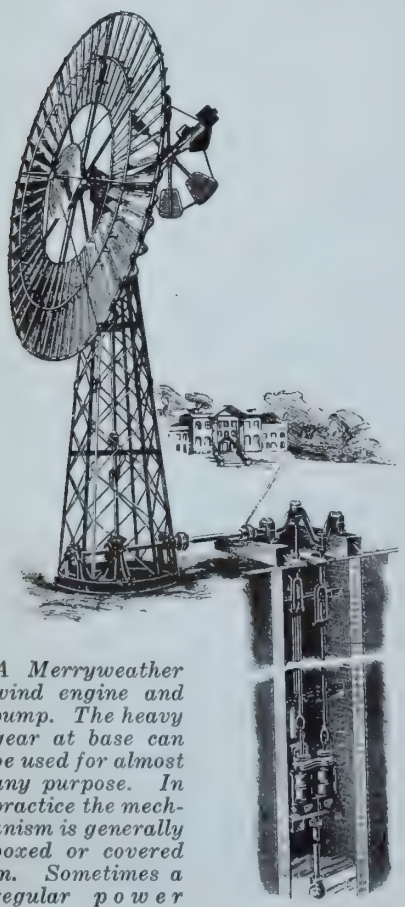
Why should there be a Hydro-Electric Commission to conserve our water pow-



Fig. 1. Head of pumping mill used only for pumping water for domestic purposes.

ers and then to convert it into electricity and convey it hundreds of miles by wire and cable at great expense when in the case of practically all rural districts it would be far cheaper to erect a windmill for generating power and to instal a dynamo and storage batteries, and when we have wind wherever electricity is needed?

It is just such men as our inquirer that are going to answer that question.



A Merryweather wind engine and pump. The heavy gear at base can be used for almost any purpose. In practice the mechanism is generally boxed or covered in. Sometimes a regular power house is built at the base of the tower.

TABLE I.

HORSE POWER OF WINDMILLS.

Diameter of Wheel in Feet.	Velocity Of Wind. Mile Per Horse Power.						
	8	10	12	10	20	25	30
	Actual Useful Horse Power Developed.						
12	0	1/8	1/4	1/2	1	1 2/3	2
16	1/8	3/8	3/4	1 1/2	2 1/4	3 1/4	4
20	3/4	1 1/4	2	3	4	5 1/2	7
25	1 1/4	1 3/4	3	4 1/2	6	8	10
30	2	3	4	5 1/2	7	9	12

However, the following information will show that wind can be used and used economically on a farm or for rural residences or generating both light, heat, and power.

There are two types of windmill; one is simply a pumping mill and the other may better be designated a wind engine. The first kind will lift water approximately 25 feet or so and fitted on lightly built towers, the whole pumping head only weighing probably about 50 lbs. These are equipped with a wheel generally about 8 feet in diameter, having 18 vanes each.

Fig. 1 shows the head of such a pumping mill. Some manufacturers give such a type the name of "Air Motors."

The type of power wind engine, or mill suitable for heavier duties is of a very different construction, and is built on heavy towers, not necessarily very high, but should be located more in the open.

They, too, are fitted with vanes in somewhat the same manner as the aforenamed type of mill, except that the diameters are larger, the number of vanes greater, and these are not fixed ones. The vanes can be regulated automatically to suit the wind that is blowing. If such provision were not made, the force of the wind would break the whole wheel.

so great is the power. Fig. 2 shows what is known as a Merryweather Wind Engine. Such an engine can be used for every purpose where power is required. And if a fair sized engine is installed, and an electric generating unit fitted to same, with storage batteries, it then would be possible to

TABLE III.

HORSE POWER DEVELOPED WITH 16 MILE BREEZE.

Diameter of Wheel in Feet	Revolutions per Minute	Approximate Horse-Power Developed
20	40	1 H.P.
25	35	1 3/4 "
30	28	3 1/2 "
40	22	7 1/2 "
50	18	12 "

generate as much horse power in electricity as the horse power by the wind engine, and the electric current could be used for both light, heat and power.

Such appliances, of course, cost a considerable amount first cost, but the up-

TABLE II.

PUMPING POWER OF WINDMILL.

Diameter of Wheel in Feet.	Horse-Power from Shaft.	Horse-Power in Water Pumped.	Gal of Water 15ft High per Hour.	Irrigation in Acres Column 4.	Gal of Water 25ft High per Hour	Irrigation in Acres Column 6.
8 1/2	1/9	0.04	616	0.18	370	0.10
10	1/16	0.12	1.918	0.57	1.151	0.339
12	1/4	0.21	3.420	1.02	2.036	0.60
14	4/10	0.28	4.530	1.37	2.708	0.798
16	1/2	0.41	6.460	1.84	3.876	1.142
18	2/3	0.61	9.768	2.83	5.861	1.727
20	1	0.79	12.465	3.65	7.479	2.20
25	1 1/2	1.34	21.233	6.27	12.743	3.75
30	3	2.25	31.660	12.88	19.000	7.61

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keep is very small and depreciation almost nil.

Table I. shows the horse power of windmills, sizes of wheels and velocity of wind necessary to develop any given horse power.

Table II. refers to the horse power as well as the pumping capacity where capacity may be increased without increasing the size of the boiler. The furnace may be adjusted to burn through any desired fuel thickness to accommodate fuels of variable densities. Also, the furnace may be adjusted to burn any kind of fuel without changing the boiler in any way. Finally, the magazine furnace may be adjusted to burn various sizes of hard coal from stove size to buckwheat, as well as soft coal, without smoke.

In a catalogue published by the company descriptive of this new boiler, tables of boiler capacities are given for the various conditions of operation, worked out in detail according to the latest ideas for rating boilers. Colored photographs are shown of the construction of the boiler and there are also detail views of the center section showing the self-sealing material attached to the flue walls and water-cooled grate attached. Size of catalogue 8 x 11 in. Pp. 19.

volume of water for irrigation purposes is a main factor.

Table III. shows the horse power of different diameters of wheels with a 16-mile breeze. It will be seen that a 20-foot wheel in a 16-mile breeze will develop 1 horse power.

The question of reliability of having wind at all times is of great importance, but the best authorities inform us that in Canada and United States the average wind powers are as follows:

"It is estimated that in Canada there is an average velocity of wind of 8 miles per hour for from 5,000 to 6,000 hours per year, and approximately a 16-mile wind for about 3,000 hours for, roughly speaking, 10 hours per day, so if our readers will take and analyze these figures and consider the data in the tables, it will be found that wind power is not by any means a power that should be overlooked. Such wind engines would be real conservers of fuel throughout the whole of the Dominion.—Editor.

A New Adjustable Magazine Boiler

A new type of house-heating boiler, with an adjustable magazine furnace, has been brought out by the Thompson Heater Corporation, Buffalo, N.Y. It is known as the Thompson boiler, being designed and perfected by C. B. Thompson, the president of the company and a well-known writer on heating subjects.

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Are not these reasons enough? Then why hesitate longer?

PURO equipment is not expensive—the first cost is *low* and the up-keep *nothing*. Easily attached; positively fool-proof. Let us make you a special proposition for a try-out in one of your departments. Write us now—to-day—giving us the number of men; an inquiry will cost you nothing.

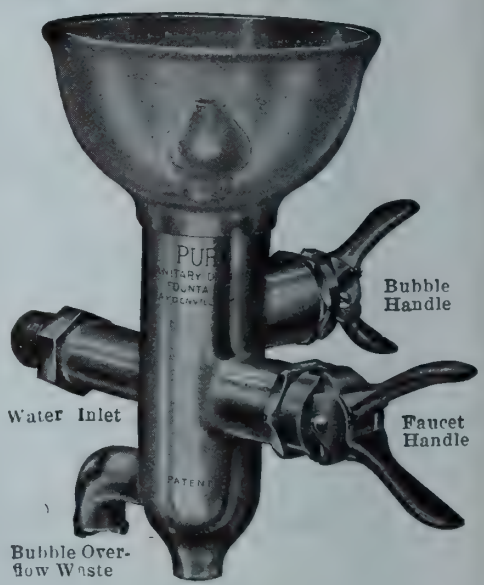
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It is the only hot water heat generator that will operate automatically both on open and closed systems. It increases radiation from 25 to 50%, and reduces the consumption of fuel.

The Knickerbocker regulator can be easily fitted to old as well as new systems, and we guarantee perfect service wherever it is installed.

The heating engineer who uses this valve when repairing old systems or putting in new ones is the man who will defy competition.

Manufacturers and dealers in a complete line of Plumbing and Heating Supplies.

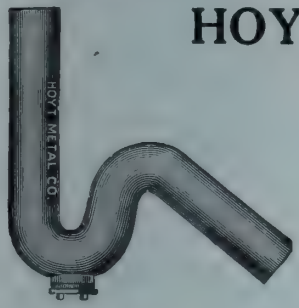
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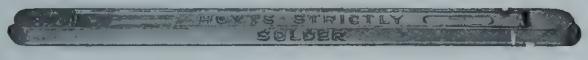
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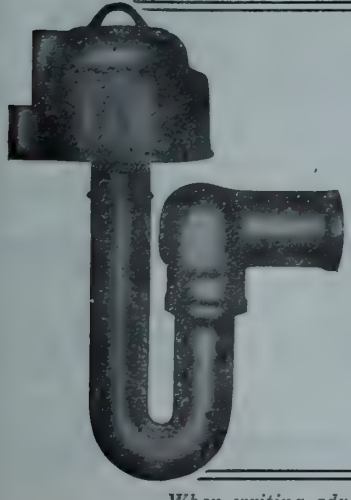
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John Bayne Maclean — Robert W. Service
Archie P. McKishnie — Alan Sullivan, *et al.*

RAISING THE CANADIAN ARMY

The leading article in the February issue of MACLEAN'S MAGAZINE will give the inside story of the formation of the "First Thirty Thousand" and of the part **Sir Sam Hughes** played in it. It will bristle with stories never told before.

SOLVING OUR IMPERIAL PROBLEM

The second article by **George Bernard Shaw** will appear. It is headed, "The Folly of Ulster," but it lays down the basis on which the British Empire must be constituted after the war.

THE DANGER OF THE DYNASTIES

An article by **John Bayne Maclean,** in which he shows how the quarrelling and meddling of monarchs brought about trouble in Europe that led to the war. It is a fearless and intensely interesting article.

BEHIND THE CANADIAN LINES

A second article by a Canadian artist serving in France, **H. W. Cooper,** giving some unusual experiences and profusely illustrated with pen-and-ink drawings by the author.

FINDING THE MEN FOR WAR

An article dealing with the labor problem by **Agnes C. Laut.** It shows how acute the crisis in man power has become in Canada and the United States and suggests the remedy.

WHEN WILL THE GOVERNMENT START?

An editorial article on the need for immediate action on the part of the Government to increase food production in Canada during 1918—a strong indictment of government laxness.

ROBERT W. SERVICE

Another stirring war poem in the new series by this master of martial verse, Canada's most famous poet.

SAFETY IN SUBSTITUTES

An article by **Ethel M. Chapman** on methods of food conservation during the winter months.

THE BALLAD OF THE FORTY SILENT MEN

A story of the battle of Cambrai in verse form by **Alfred Gordon,** a young Canadian poet of remarkable promise.

FICTION

THE WINNING OF YOLANDE

A delightful love story, the third and last of a series by **Ethel Watts Mumford.**

IN THE SHADOW OF OLD CREATION

A strong story of adventure by **Archie P. McKishnie.**

THE PAWNS COUNT

Another long instalment of the secret service serial by **E. Phillips Oppenheim.**

THE MAGIC MAKERS

Second instalment of the strong Canadian serial story by **Alan Sullivan.**

CAPTAIN CARLOTTA

A story of submarine chasing and of a mysterious invention by **W. Victor Cook.**

ALL THE USUAL DEPARTMENTS

The Business Outlook.
The Investment Situation.
Books.
Women and Their Work.
Review of Reviews.

THE BEST NUMBER YET.

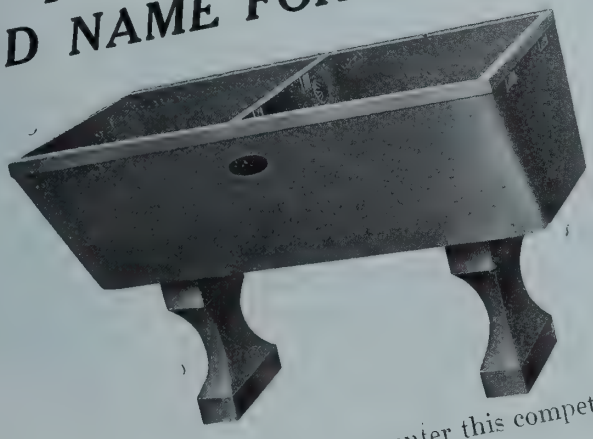
At All News-Stands 20c.

A FEW OF THE SUGGESTED NAMES

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Aristocrat
Adanac
Booster
Cameco
Cameto
Columbia
Devonshire
Durable
Economy
Excelo
Faultless
Granite
Haig
Harristub
Imperial
Invincible

Joffre
Leader
Maple Leaf
Optimist
Perfecto-Tub
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President
Regal
Rooster
Sanitary
Superb
Uneeda
Universal
Victor
Victory
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Vimy

HAVE YOU SENT US WHAT YOU THINK WOULD BE A GOOD NAME FOR THIS TUB?



There's still time for you to enter this competition and win one of the

THREE FIFTY-DOLLAR VICTORY BONDS

Just read over the advertisements that have appeared in the SANITARY ENGINEER under dates Dec. 1st, Dec. 15 and Jan. 1st. There you have all the particulars before you and can get right down to "brass tacks" and do your best to win one of these Victory Bonds.

We've Done Our Bit

One thing we know is that we have done our bit in making what has been stated by men who really know, the finest laundry tub ever put before the trade.

How about trying a sample tub?

CANADA METAL COMPANY, LIMITED

MONTREAL TORONTO HAMILTON WINNIPEG VANCOUVER

WE HAVE EVERYTHING FOR THE PLUMBER

HAVE YOU TRIED OUR SOLDER, TRAPS, BENDS, SHEET LEAD, LEAD PIPE

When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER.

King Boilers get up heat quickly

Very shortly after the fire is lighted in a King Boiler hot water reaches the radiators. The thin, peculiarly shaped waterways in the "King" mean quickly heated water and perfect circulation. The perfect circulation causes a saving in fuel because it obviates the necessity of "extra firing" to move cold water from the radiators.



The Trade should use this quick-heating, fuel-saving argument now while fuel is scarce and high in price.

WRITE US FOR PRICES

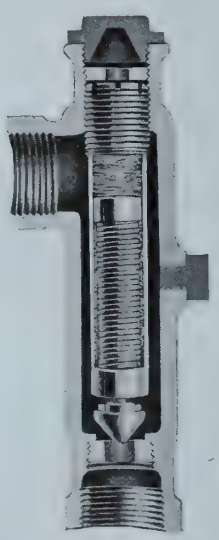
Steel and Radiation, Limited

Head Office, FRASER AVENUE, TORONTO

304 University Street, MONTREAL **101 St. John Street, QUEBEC**

AGENCIES IN ALL LEADING CITIES

Trap Every Steam Line With a "SARCO"— Radiators Too



The Steam Trap "SARCO" is not like other steam traps, it relies on the expansion of a heavy hydrocarbon oil operating a Sarco spirally corrugated Tube within a renewable cartridge. When steam reaches the cartridge, the trap closes and no steam escapes. When condensation collects the trap opens and discharges it.

The "Sarco" can be used on either steam lines or radiators, for low pressure, vapor or vacuum heating system; is easily installed, automatic in operation.

The "Sarco" is absolutely noiseless, self-cleaning and no moving parts. All parts of the interior are interchangeable and removable. The "Sarco" can be attached to radiators at any angle, and in any position.

Prices low. Write us at once. Can make prompt deliveries.

Peacock Brothers, Montreal

and **220 King Street W., Toronto**

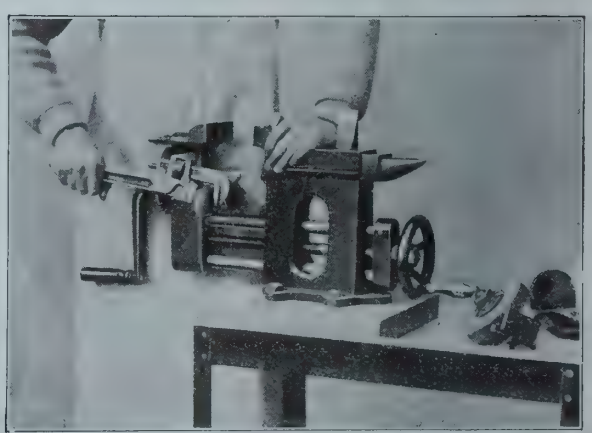
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THE

Stewart Handy Worker

An Equipment All in One



WEIGHS 90 POUNDS

The Equipment Comprises——

A Pipe Vise
A Bench Vise
A Bench Grinder
A Two-Speed Drill
A Hardy Cutter
An Anvil

It's not a toy. It's a real combination of practical tools for practical people.

Write for full particulars.

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12th Street and Central Avenue

Department H.W. **CHICAGO, U. S. A.**

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X Laboratories 35

Thousands of Shrewd Fitters Have Discovered a NEW WAY to Make MORE MONEY!

THEY used to tear down a leaky or cracked boiler—waste time—perhaps wait a week or more for new sections—keep the customer in the cold—send a big bill—and **at that** not make very much profit!

Now—they simply pour "X" Liquid into the boiler. No welding—no dismantling—nothing to take apart. In 30 MINUTES THE JOB IS DONE! The cost is from $6 to $10. They get a GOOD price for the job—and **the customer** is perfectly satisfied. **"X" Liquid enables these fitters to do more work every day.**

"X" IS A PURE LIQUID. It is poured into the boiler and combines with the water. In sizzling out through the leak or crack the "X" is changed instantly into a solid, making a **permanent repair.** You don't have to know where the trouble is. "X" finds the leak or crack—and repairs it automatically.

The surplus "X" that remains in the water **prevents rust and scale.** "X" is not a cement or powder. Cannot clog air valves.

YOU OWE IT TO YOURSELF TO TRY "X." YOU CAN'T LOSE. "X" IS GUARANTEED TO WORK OR YOUR MONEY WILL BE RETURNED.

"X" *The Wonderful* BOILER LIQUID

$6 WORTH WILL DO A $100 REPAIR JOB IN 30 MINUTES.

"X" LIQUID IS USED BY

Pierce, Butler & Pierce, U.S. Radiator, Richardson & Boynton, Federal Radiator Co., General Electric Company, U.S. Government, National Radiator Co., Standard Sanitary Co., Crane Co., Gurney Heater Co., and many thousands of progressive steamfitters.

Your jobber will order it for you—or we will ship direct. Write for trade discounts—NOW!

"X" Laboratories

636 Washington St. - BOSTON, MASS.



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Empire Mfg. Co., Ltd., London, Ont.
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(Patented)



Plate No. 375

ARTISTIC DESIGN
No Hump in Front.
Graceful Lines.

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Insist on "C—B." Brass Goods



Fig. E1112

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A Quick Opening Basin Cock. Cast all in one piece.
THE ALL RED METAL PRODUCT

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Toronto Office: B.O.T. Building, 159 Richmond Street West

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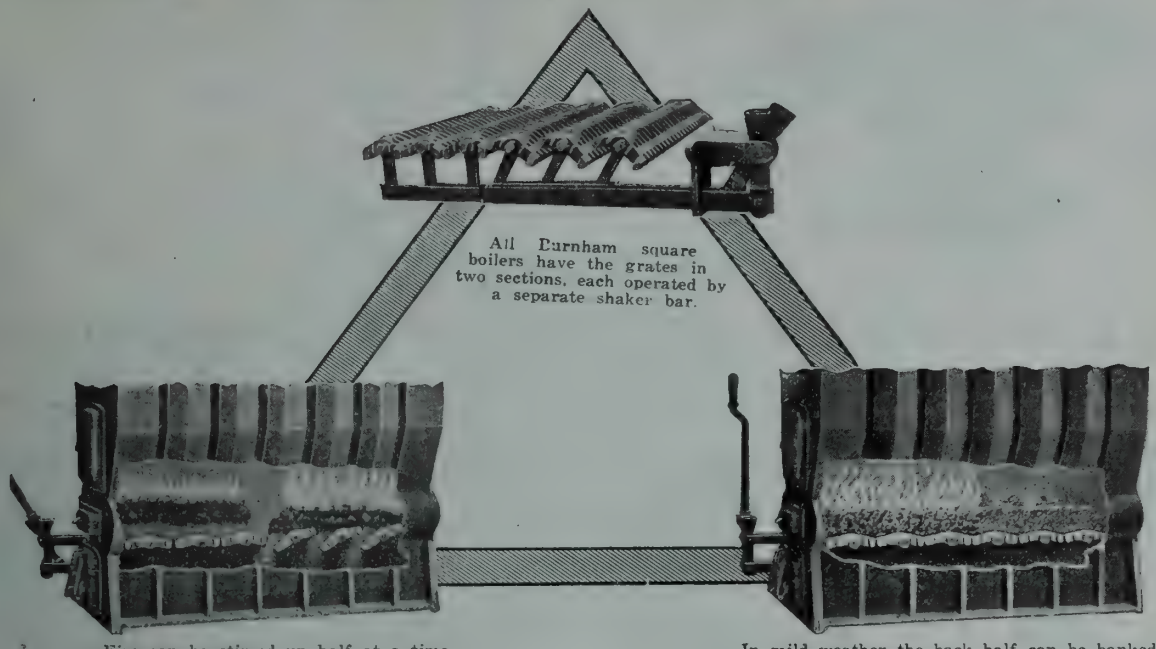
BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.
All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES Black and Galvanized All Sizes

Ask your jobber for CT Brand

CANADIAN TUBE & IRON CO., LIMITED
Montreal Works: Lachine, Can.

YOUR WANTS are many here below. Use the want ad. page and get rid of a few of them.



All Burnham square boilers have the grates in two sections, each operated by a separate shaker bar.

Fire can be stirred up half at a time.

In mild weather the back half can be banked up with ashes and fire run on the front half.

Nerve Grates
Here's One That Doesn't

MOST grates grate on nerves. On your nerves when you put them in. On your customers' nerves "ever after."

As we said above—**here's** one that doesn't. It's the Burnham Boiler's grate.

Doesn't grate on **your** nerves, because it's easy to put in.

The end of the grate is at such an angle that you can simply drop it in the lug. No trouble whatever to replace when necessary.

Doesn't grate on **your customers'** nerves. Its roof-like double-trussed ridge breaks up the most stubborn clinkers. Doesn't stick. Doesn't warp out of shape.

Just twice as easy to shake, because the grates shake **half at a time.**

Fire can be cleaned **half at a time.** Fire can be stirred up **half at a time.** The other half left slumbering. Or, in mild weather, the back half can be banked up with ashes. Just the heat actually needed secured. Just the coal actually needed to secure it, burned.

So you see the Burnham's grate not only stops grate nerve gratings. It stops coal bill nerve gratings as well. Which is especially welcome news to boiler buyers in these days of coal scarcity.

So tell it to **your** boiler buyers.

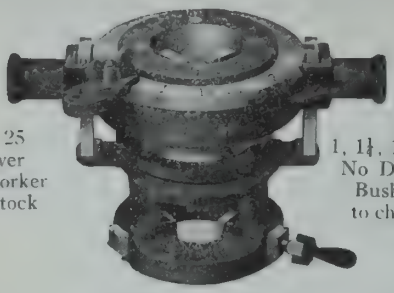
Other just-as-welcome Burnham Boiler news items, our Catalog lines up.

Send for it.

Lord & Burnham Co.

Irvington, N.Y.

Representatives in All Principal Cities



No. 25 Beaver easy-worker Die Stock

1, 1¼, 1½, & 2 No Dies or Bushings to change

You Don't Pay for "Beavers"—

THEY PAY FOR THEMSELVES

Figure it out for yourself! Thousands of Beavers have been in constant use for nearly 10 years—and are still good.

The cost works out at about ½ cent a day for the tool shown in this advertisement.

Call up your jobber now—and order a "Beaver" or at least write for booklet D-12.

MANUFACTURED BY

THE BORDEN-CANADIAN COMPANY

TORONTO, CANADA



OPEN VIEW NO. 10-A.

The CEILING PLATE that's better



TOP VIEW NO. 10-A.

THE NO. 10—A NARROW FLANGE PLATE IS A STEEL HINGED PLATE. FLANGES ¾" WIDE. HIGHLY FINISHED. ESPECIALLY DESIGNED FOR TWIN CONNECTION "NARROW."



Gem No. 4.

The split ceiling plate is coming more and more into use than ever and ALWAYS GIVES A NICE FINISH, because it can be attached to mains and risers at the very last, and is not exposed during completion of a building on the floors.

High quality at the right price.

Gem No. 4 Automatic Air Valve

Made from the best brass obtainable. Pressed shell and pressed brass base which eliminate danger from blowholes, which is a fault with cast bases.

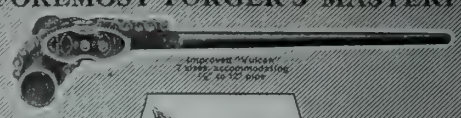
Write for catalog showing our complete line of specialties.

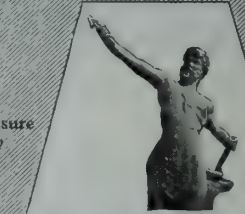
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New Britain, Conn.

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Double ended Reversible jaws afford *Unequalled economy*

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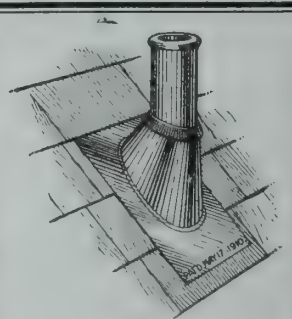
IT IS IMPORTANT!

If you have something to dispose of in goods or service that as many buyers as possible get to know you and your product. This can be accomplished through

Sanitary Engineer

143 University Avenue, Toronto

HAVE YOU USED THE "Simplex" ?



Prices to Trade

2-in. $1.00 4-in. $1.15 ea.

Made in all sizes from 1¼ to 6-in.

They fit any pitch from flat to 50°. Easy to apply. Made of heavy gauge galvanized iron, with pure lead collar soldered on, not merely pressed on.

Any jobber in Canada can supply the "Simplex." Give your favorite jobber an order.

SIMPLEX SALES COMPANY

CHICAGO, ILL.

Canadian Representative: W. H. CUNNINGHAM, 98 Kingswood Road TORONTO, ONT.

"B&C" COMBINATION COLD ROLLED STEEL Floor and Ceiling PLATES

Carried by the leading supply houses



No. 15

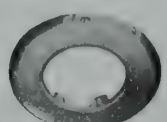
Puts just the right finish on that heating job

Send for catalog of complete line of "B. & C." goods.

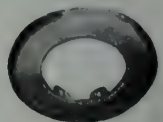


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Stock carried by our Canadian Representative W. H. CUNNINGHAM. 97 Kingswood Road. Toronto, Ont.



No. 16



No. 17

The Beaton & Corbin Mfg., Co. Southington, Conn., U.S.A. The Old Original Company

There can be no rust or corrosion in a Dart Union because the face and seat are of bronze.



Dart Unions save time as well as trouble



There is a saving of time as well as an assurance of permanence in using Dart Unions. Pipe lines can be easily and quickly connected, whether in or out of alignment. The ball-shaped joint permits a connection to be made so long as the nut can be started on its thread.

Save time and have a better job by always using Dart Unions.

All jobbers sell them.

Manufactured by

DART UNION CO., Limited

TORONTO, CANADA

KERR GATE VALVES



I. B. GATE

These Iron Body Gate Valves were designed and are made by US to meet YOUR demand for strong, substantial, interchangeable valves, with "nobby" appearance.

They meet the requirement and more. When they get us a customer they hold him.

Who in the Steamfitting trade has not heard of and used Kerr's (Weber) Brass Gate Valves? We say "Kerr's"—not the imitations. We make this valve of uniform material, and they stand up to the work given them, just as they always have. Some have tried others, but they came back to the tried and trusty old "Weber Gate" made by Kerr. What is a few cents on a valve, when you can get one like the genuine "Weber"?

Have you our Catalogue No. 5 ?
If not, we will mail you one.
A postal to-day will bring it.



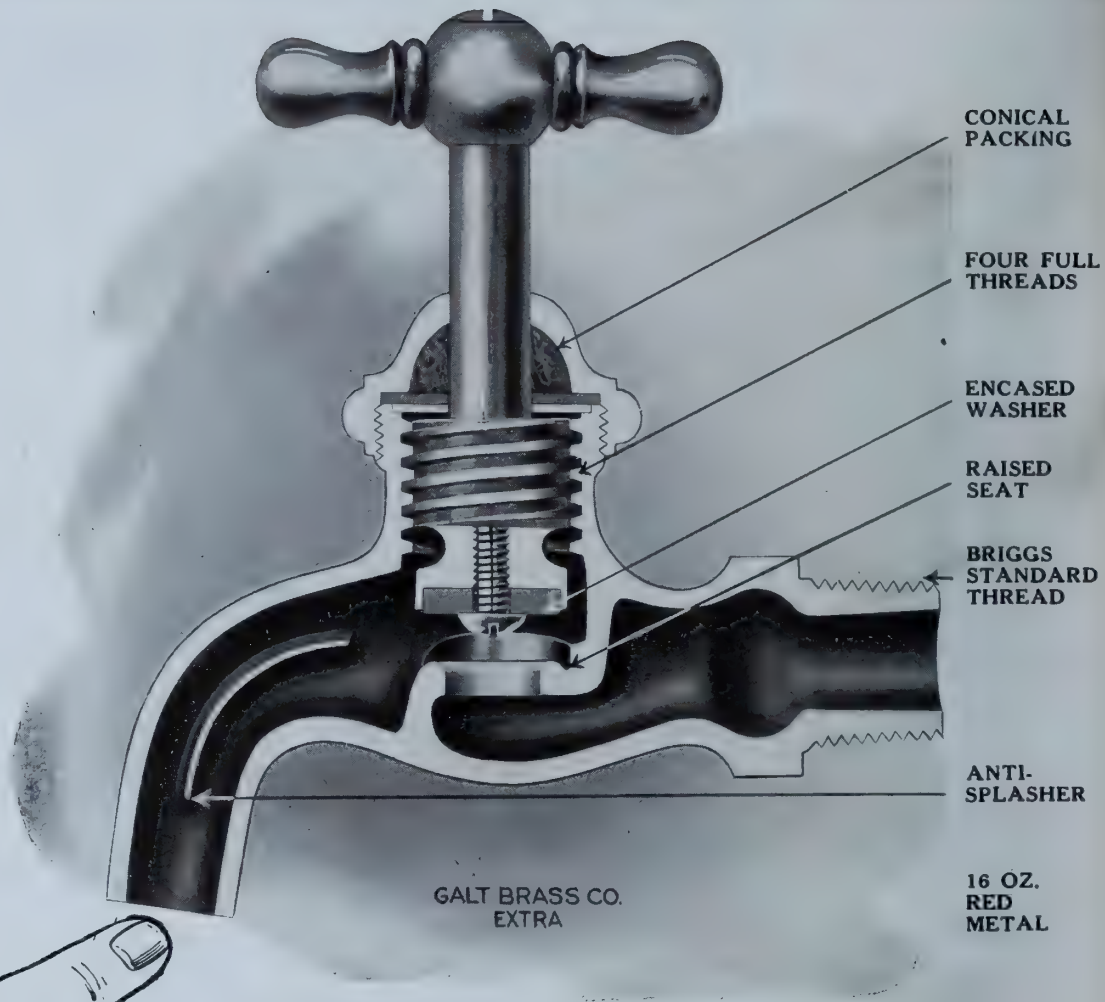
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THE KERR ENGINE COMPANY, LIMITED

WALKERVILLE, ONTARIO

Registered **PERFECTO** *Trade Mark*

You Can Install This Line and Establish Confidence of Your Customers





GUARANTEE

Any article of our make proving defective through inferior metal, or improper workmanship, on our part, will be replaced with TWO good ones, at NO CHARGE to you.

CAN YOU BEAT IT?

SEND US YOUR ORDER NOW

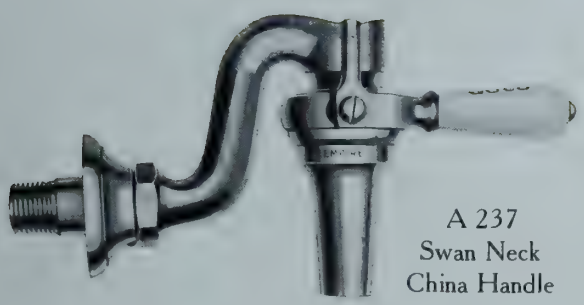
Galt Brass Company, Limited

Galt, Canada

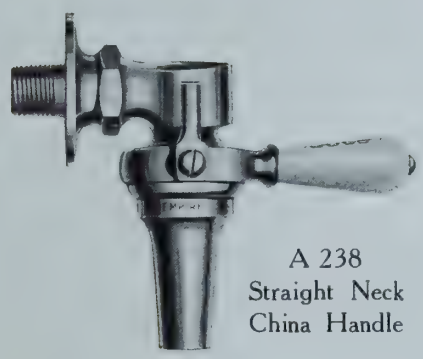
SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

Vol. XII. Publication Office, Toronto, February 1st, 1918 No. 3



A 237
Swan Neck
China Handle



A 238
Straight Neck
China Handle

"Kitchener" Packless Quick-Opening Bibbs

For kitchen, slop sink and laundry tray where quick and easy operation without splashing is desired.

"Kitchener" Packless, Quick-Opening Faucets are specially designed to give quick action and to prevent splashing. A half turn of the lever gives a full stream that flows smoothly from the long nozzle avoiding entirely spreading and spattering and reducing splashing to a minimum. They are made of a high-grade red metal and require no packing.

All "Empire" products are of perfect quality and calculated to give the very best service. By supplying "Empire" goods you give your customer effective insurance against trouble.

EMPIRE MANUFACTURING CO., LIMITED

LONDON TORONTO

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While



A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for BEAVER BRAND CAST IRON ENAMEL WARE

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

ONTARIO:
Monarch Brass Mfg. Co., 71 Brown St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes, 120 Lombard St., Winnipeg

EVERYTHING IN RUBBER



MADE IN CANADA

Looking Forward

The Dominion Rubber System policy is *"To Serve and Please the Trade."* That policy will be more in evidence during 1918 than ever before.

Despite changed and changing conditions in Trade and Manufacturing, there will be no lessening of our efforts to meet every need in Rubber, no matter from what source it may emanate.

For more than half a century we have set the pace, and our position this year will be more pronounced because of the greater and better service we can and will render.

Our service branches, in the principal cities of Canada, will give prompt and intelligent attention to all enquiries. Our experts are ready with their advice, where needed.

Canadian Consolidated Rubber Co. Limited

Head Office - - MONTREAL

Service Branches at Halifax, St. John, Quebec, Ottawa, Toronto, Hamilton, Kitchener, London, North Bay, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Lethbridge, Edmonton, Vancouver, Victoria.

The Largest Manufacturers of Rubber in the British Empire.

Quality — Efficiency — Service

For ten years the above slogan has been our watchword. It has helped you as well as ourselves. For the coming year we will endeavor to keep pace with our record of the past. Direct your orders our way.

B-O-T Water Closets Brass Goods

Canadian Brass Company, Limited

GALT TORONTO

PIPE THREADING TOOLS

It is Evidence Like This



"Toledo" Geared Adjustable Threading Tool No. 2 making a cut and thread on a 4-inch bend in position. It was desired to install a steam separator above throttle of engine, and the whole job was satisfactorily completed without removing the pipe line.

which proves the extra value of "Jardine" and "Toledo" Pipe Threading Tools

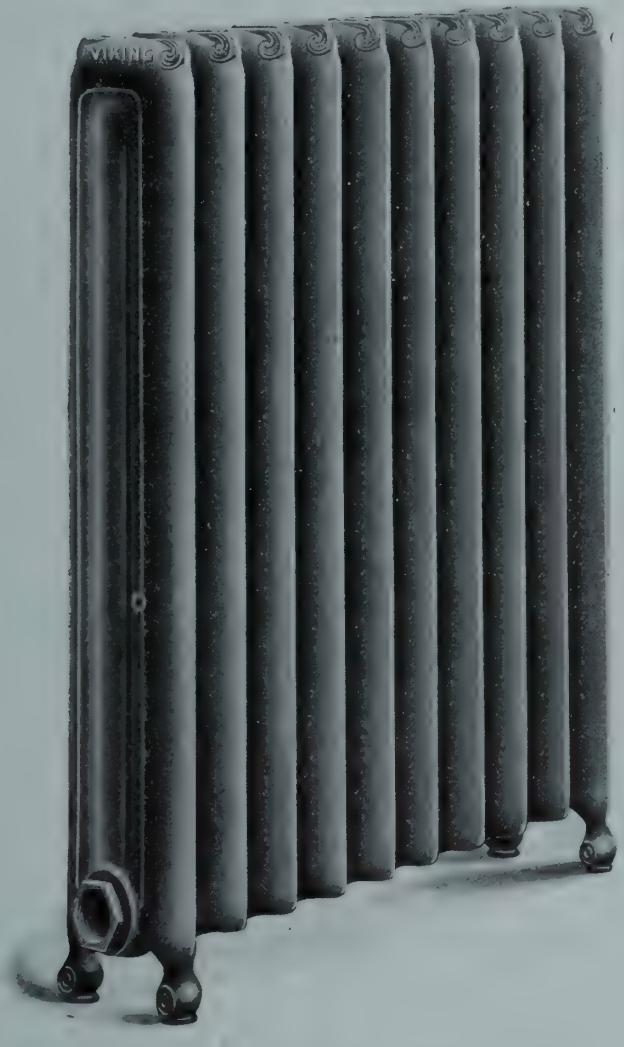
"Jardine" and "Toledo" Pipe-Threading Tools cut clean, sharp threads with a minimum of muscular effort. They permit of one man doing work which ordinarily requires two. But even more important than this, they will work in any odd corner. Instance the job illustrated in the accompanying engraving. Here is a case where, with an ordinary tool, the whole pipe line would have had to be taken down. The tool paid for itself on that one job.

Investigate "Jardine" and "Toledo" Tools yourself. Ask us to send names of users in your locality. Then go and talk to these men in your own business and learn what they think of these good tools.

A. B. JARDINE & CO., Limited, Hespeler, Ont.

Sole makers of "Jardine" Pipe-Threading Tools.
Sole licensees to manufacture and sell Toledo Pipe-Threading Tools in Canada.
Agents, Winnipeg and West—Stanley Brock, Ltd., Winnipeg, Man.
Brockville and East—J. R. Devereux, 233 St. James St., Montreal.
Belleville and West—W. H. Cunningham, 98 Kingswood Road, Toronto, Ont.

Daisy Boilers and Viking Radiators Have No Equal



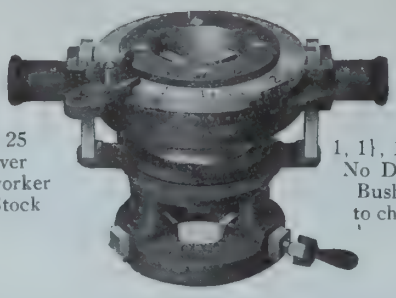
BACKED BY OVER 50 YEARS OF PRACTICAL EXPERIENCE

For Efficient and Economical heating, specify Daisy Hot Water Boilers and Viking Radiators and conserve the fuel for your country by this installation.

The Daisy Boiler is manufactured only by

WARDEN KING LIMITED, MONTREAL

BRANCH, 200 Adelaide St. West, TORONTO



No. 25 Beaver easy-worker Die Stock

1, 1¼, 1½, & 2 No Dies or Bushings to change

You Don't Pay for "Beavers"—

THEY PAY FOR THEMSELVES

Figure it out for yourself! Thousands of Beavers have been in constant use for nearly 10 years—and are still good.

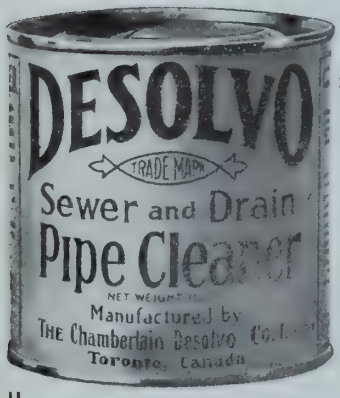
The cost works out at about ½ cent a day for the tool shown in this advertisement.

Call up your jobber now—and order a "Beaver" or at least write for booklet D-12.

MANUFACTURED BY

THE BORDEN-CANADIAN COMPANY

TORONTO, CANADA



Desolvo and Cold Water Clears any Obstruction

The quickest, cheapest, most sanitary way to move any obstruction in drain pipes, whether caused by frost or an accumulation of foreign matter, is to mix a little Desolvo in cold water and pour down the pipe.

The process is just as simple as it sounds, and just as effective as it is simple.

Drop a line on your own letter-head, giving the name of your jobber, and we will send you a trial can absolutely free. You will then see just what DESOLVO can do.

Chamberlain Desolvo Co., Ltd.
TORONTO
Box 741. General Offices, Pittsburgh, Pa.

Joseph Breeden & Co., Ltd.

NEW MILL WORKS
Fazeley Street, Birmingham, England



MANUFACTURERS OF

HIGH CLASS

Steam and Water Fittings

WE SPECIALIZE

In the Manufacture of

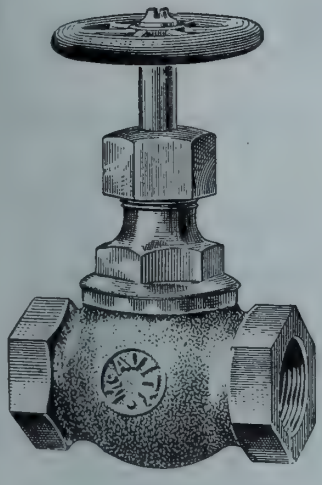
CAST IRON SOIL PIPE and FITTINGS

as well as

GALVANIZED RANGE BOILERS AND EXPANSION TANKS
FOR HEATING SYSTEMS

TORONTO HARDWARE MFG. CO., LIMITED

We have yet to see a Better Valve than the



"McAvity" VALVE

Every Valve packed and tested before leaving factory.

Let us quote you a quantity price. Prompt shipment from stock.

T. McAVITY & SONS, Limited

Montreal **ST. JOHN, N.B.** **Winnipeg**

Pipe Machines of Merit



THE HALL No. 8

Duplex Improved Gear Box Driven. Capacity 2½ in. to 8 in. inclusive.

Note the drive belt at rear out of operator's way. Elevated die cabinet, control lever and speed levers all convenient to operator's right hand. Sliding die head.

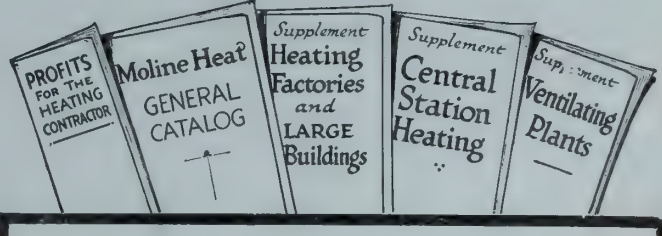
These machines are equipped with a friction clutch, enabling operator to revolve pipe a few inches, if necessary.

Pipe Machines ranging from ⅛ to 18".
Nipple Machines ranging from ⅛ to 4".
Roller Pipe Cutters ranging from ⅛ to 4".

Delivery from stock.

Write us for full particulars and prices.

John H. Hall & Sons, Ltd., Brantford, Can.



These Valuable Books *Free!*

Each one is worth big money to you. Every heating contractor should have them. They cover all the latest money-making ideas in figuring and installing steam heat—hot water heat—vapor heat—and vacuum systems.

These books will help you to land more orders and increase your profit on every job. Write for them at once. They are absolutely ***FREE!***

Moline Heat EVERYWHERE

Moline **Illinois**

When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER.

MACLEAN'S
MAGAZINE for FEBRUARY

John Bayne Maclean Robert W. Service
Agnes C. Laut George Bernard Shaw
Archie P. McKishnie Alan Sullivan, *et al.*

The Ending of the War—When? How?

JOHN BAYNE MACLEAN writes with amazing courage and information about the war situation, past and present, in the February issue of MACLEAN'S MAGAZINE. He tells of the bungling of politicians in Britain and elsewhere—men of Cabinet rank who baulked the military and naval leaders, and in his exposures he includes some military and naval men. What Colonel Maclean writes rubs some men the wrong way—those who have "ostrich minds." But the whole English-speaking world is Colonel Maclean's debtor for publicly stripping away the concealments of truth, and letting the world see things as they actually are. Colonel Maclean's contribution is entitled **"Why We Are Losing The War."**

The Eternal Irish Question

this time dealt with by that surprising, bold-thinking, unharnessed man, *George Bernard Shaw*. Mr. Shaw puts the Irish Question forward in a fresh way, and proposes a novel—yet not impracticable—solution. Writing in trenchant style, and always sensibly, Mr. Shaw is worth reading. MACLEAN'S MAGAZINE shares with a London (England) daily paper the right to publish this article by Mr. Shaw. In passing, we desire to suggest to you that the class and quality of articles and contributors which MACLEAN'S MAGAZINE is securing are matters for all Canada to have pride in.

It scarcely needs to be said that such a wealth of good reading matter, much of it of first-class current interest, makes MACLEAN'S MAGAZINE take its place fairly alongside the best magazines in the world.

FICTION

THE WINNING OF YOLANDE
A delightful love story, the third and last of a series by **Ethel Watts Mumford.**

IN THE SHADOW OF OLD CREATION
A strong story of adventure by **Archie P. McKishnie.**

THE PAWNS COUNT
Another long instalment of the secret service serial by **E. Phillips Oppenheim.**

THE MAGIC MAKERS
Second instalment of the strong Canadian serial story by **Alan Sullivan.**

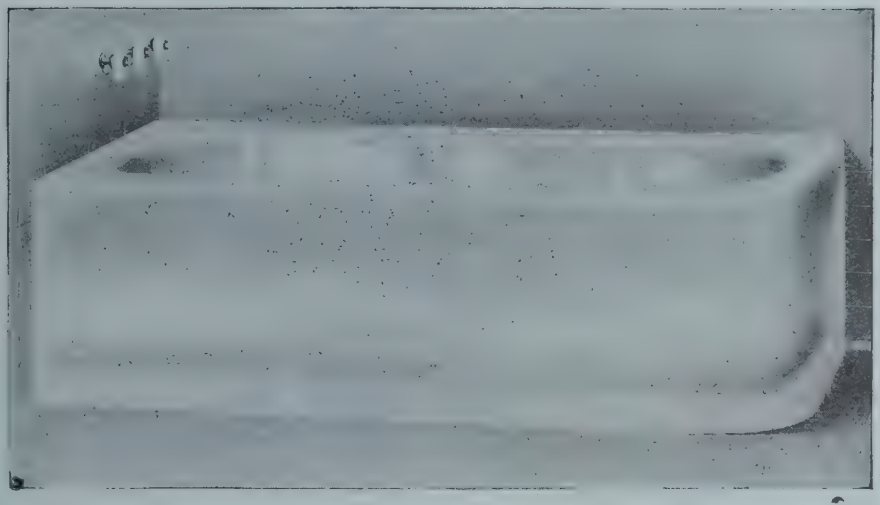
ALL THE USUAL DEPARTMENTS
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The Investment Situation.
Books.
Women and Their Work.
Review of Reviews.

THE BEST NUMBER YET.

At All News-Stands 20c.

"Standard"
"Perfection" Built-In Baths

Made in One Piece Enamelled All Over



These Baths represent the last word in design and finish, and are made to build into Right or Left Hand Corner or into a Recess.

The "Perfection" Built-in Bath is only 17½ inches high, therefore convenient. It builds into walls and floors, the absence of all dust-collecting cracks and corners, meaning bathroom sanitation.

Made in 5 and 5½ foot sizes.

Illustrations on request.

Write the nearest dealer.

Standard Sanitary Mfg. Co.
Limited

General Office and Factory, Royce and Lansdowne Aves., Toronto, Ontario

Toronto Store:
55-59 Richmond Street East

Winnipeg Showrooms:
76 Lombard Street

Hamilton Store:
20-28 Jackson Street West

Montreal:
4 Beaver Hall Square

Calgary:
31 Canada Life Building

Vancouver:
847 Beatty Street

"MADE IN CANADA"

SANITARY ENGINEER
PLUMBER AND STEAMFITTER OF CANADA

Vol. XII. TORONTO, FEBRUARY 1, 1918 No. 3

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EDITORIALS

More Residences Being Built—Humidity in the Home.

The MacLean Publishing Co., Limited

JOHN BAYNE MACLEAN, *President* ESTABLISHED 1887 H. T. HUNTER, *Vice-President*
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SANITARY ENGINEER, PLUMBER and STEAMFITTER of CANADA

Edwin Newsome, *Editor*

R. L. Netherby, *Western Ontario Representative* Fred McLaughlin, *Eastern Ontario Representative*
H. M. Reid, *Montreal and Eastern Manager.*

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GREAT BRITAIN—LONDON, The MacLean Company of Great Britain, Limited, 88 Fleet Street, E.C., E. J. Dodd. Director. Telephone Central 12960. Cable Address: Atabek, London, England.

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Think of it!
Ten Years without a leak

EVERY TANK GUARANTEED



Vitro Tanks that were installed ten years ago are still going strong without sign of the first leak.

Surely this fact is sufficient evidence that tank troubles have been successfully overcome.

In the construction of the Vitro all chance of trouble is avoided by eliminating those features which in other tanks cause trouble. The Vitro is all in one piece with no joints to open up and no linings to leak.

Installing Vitro No-Trouble Tanks is a mighty profitable way of building a permanent, satisfactory business. It gains for you a reputation for reliable, honest work that is well worth while.

Ask your jobber about Vitros.

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Cluff Manufacturing Company, Limited

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HANDLED BY EVERY JOBBER FROM COAST TO COAST



Those Good Resolutions

The resolutions you have adopted to help make Nineteen-Eighteen your very best business year will gain added force if you determine to hitch up to Port Hope Enamelware.

Port Hope Enamelware makes a splendid running mate to **good** resolutions because it is so good itself. Like the sincere resolution Port Hope Ware countenances no half-way measures. It is made up to a rigid standard of quality—no seconds—every piece "first grade."

From the first it was resolved to make only one grade—and that the best possible. This tended to eliminate all chance of slighted work. Every workman in the Port Hope factory is constantly striving for better results, and efficient supervision and inspection prevent any mistakes.

The beautiful snow-white appearance of Port Hope Enamelware, and the uniformly excellent service it gives are the result of closely following a good resolution. Hitch your good resolutions up to ours and let's pull together for bigger, better and more profitable business in Nineteen-Eighteen.

Port Hope Sanitary Mfg. Co., Limited

Factory:
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Head Office:
ROYAL BANK BUILDING, TORONTO

TORONTO SHOW ROOMS
119 King St. East

WINNIPEG OFFICE
405 Tribune Bldg.

MONTREAL SHOWROOMS
234 Beaver Hall Hill

SANITARY ENGINEER

VOL. XII FEBRUARY 1, 1918 No. 3

Conservation of Fuel Our Duty

Coal is Being Wantonly Wasted—Better Appliances Should be Installed — Steam Should Not be Wasted — Forcing a Fire Wastes Coal—Only Necessary When Equipment Poor

NO question has been so widely discussed of late as has the fuel question. That there is a shortage of fuel no one will deny. Scores of suggestions have been given as to how fuel should be conserved and how furnaces should and should not be fired, but what do all such suggestions amount to? Nothing whatever. It is foolish to expect that the average householder can be taught to save fuel when the appliances that are installed are so impractical and unfit to heat the average building which they are intended to heat.

Our fuel controllers are not practical men, or they would not make the suggestions they do. They recommend that people divide up the coal; that homes should not be heated to more than 68°; that hours of business should be limited, and all such nonsense. They cry out that our industries will have to close down unless our fuel is conserved, etc.

But what is really the trouble? Has there been less coal mined? Or are we failing to get the best out of the coal that is consumed? These are some of the questions which our fuel controllers should take note of.

If a few practical engineers were to take our fuel controllers to the top of a number of high buildings and show them the different smoke stacks and steam exhaust pipe terminals they would see where the coal is going; they would see that in spite of the fact that very few plants are so designed as to give off more than 70 per cent. of the heat units that can be obtained from fuel, yet at least another 20 per cent. of these heat units procured is being wantonly wasted through the exhaust pipes or return steam pipe lines. The writer was recently looking out of the window of a certain large hotel down on to some buildings below and saw between 50 and 60 pipe terminals belching steam out at a terrific rate, and this was going on from 6 a.m. to 10 p.m. Most of these buildings were used for industrial purposes. Such conditions prove at least four things: First, that these plants are wasting fuel; second, that heating engineers should get after the proprietors and sell them some steam-saving appliances, particularly steam traps, oil separators, etc., and in many cases should endeavor to get the owners of the plants to do some remodelling; third, that fuel controllers should be given the name and address of every concern which refused under any pretence to do all possible to save fuel; and last, but not least, that the heating engineer should work hard for an ordinance that will govern all heating systems, power plants, etc.

No building should be built that is equipped with fuel wasting devices. No householder should be at the mercy of the jerry builder, as is the case to-day. If such were not the case there would not be the hot air contraptions called furnaces installed that there are. Anyone can put a tin casing round an old stove, but no one can guarantee that fuel will not be wasted by such a device.

There is no doubt many a good warm air furnace; but if such a one is fully equipped with proper humidifying devices, proper heat regulators, and the like, it is very much a question which would be the cheapest to instal—a properly designed steam or hot water system or a warm air system.

The main point is, no system of heating should be a fuel waster, and somehow we feel that the time was never more opportune than at present for heating engineers to make themselves felt by showing how the matter stands. There are thousands upon thousands of houses to be built as soon as the war is over, and there will be thousands of heating systems to be remodelled. Then this work should be gone after by the



The Black Hand, entitled "Shortage."
—By John T. McCutcheon, in Chicago Tribune.

practical man, and he should refuse to be dictated to by the average architect or jerry builder. He should know his business and specify what is neded to heat certain buildings, providing ample margin for cold spells.

It would be safe to say at least 80 per cent. of the furnaces that are installed are at least 15 per cent. to 20 per cent. too small, and what does this mean? It means that fires have to be forced, that houses are made as airtight as a thermos bottle, that these furnaces are not fitted with controlling devices, etc., and that there are millions of tons of coal wasted in Canada and the United States, that millions of tons of ashes have to be carted away, that thousands of tons of coal have to be used by thousands of locomotives which is required to haul this wasted coal to our towns and cities. It means that thousands of miles of railway trackage have to be maintained, and numberless coal or freight cars are needed.

Then look at the waste of labor—the miner first, the railway men, the furnace and firemen, the immense waste in plant, etc. In fact, it is very doubtful if there is one single source of waste so great as that of fuel waste.

Then there is still another question which has a direct bearing on this subject, and that is the health of the people. No household can be healthy where a furnace is installed that is not under control. First the house or building is cold, or it is hot, but very seldom just right, and it is without doubt very important that there should be a uniform heat in our homes, the only variation being when the occupants are reposing in bed, then extra covering is furnished, just as is the case when one goes out into the open.

And all this question of fuel saving can be easily brought about by rules and regulations being applied and enforced in connection with the installing of heating systems.

It is foolish to even think that our fuel controllers can do anything to remedy matters unless there be such laws, and the best course we think the heating engineer can adopt would be to push the sale of such appliances that will really conserve fuel. They will reap ample recompense by so doing.

The Power of Suggestion

Advertising Suggests to the Reader That He Should Buy—Tells Him Why, How and Where to Buy—The Sanitary and Heating Engineering Trade is Improving in Matter of Advertising

IF the whole world were to cut out advertising what would be the result? That no doubt is a big question. Let us, therefore, ask what would happen if Edison had never advertised, or, say, the automobile manufacturer. No one can tell or even give the faintest idea. There has been more money made out of the automobile than from any other industry, considering the short time it has been a commercial commodity. The automobile and the experts and workers in that industry has been a very big factor in this war. They made the "tank" possible. And what has been the next biggest factor in making a success of the automobile industry? Advertising. There has been more money spent on advertising in the automobile industry since its advent than in any other line. The business that is established without considering advertising is bound to be less successful than it would be if a fair amount of money is laid out in that direction.

The non-advertiser, who pretends to be busy at his work, no matter what line it is, reminds the writer of a story he once heard.

A certain young lawyer decided to start in business. He bought a fine lot of books and office furniture, secured a list of the largest manufacturers, wealthy people, and men over 60 years of age, and, of course, rented an office in a good business locality.

Everything being in place and ready for business, our young lawyer decided that he would have to create some impression upon any client that might come along. So the first morning he thought he would try his hand at pretending to be busy the moment he heard any footsteps nearing his door.

He left the door ajar and sat there in readiness with the telephone within easy reach and a number of books open on his desk.

At last footsteps were heard coming in the direction of his door. He grabbed the telephone, kept one finger on the hook and began a conversation with a supposed client. "Oh, yes, Mr. Brown, I know it is rather a complicated case, but I believe we can win on those very points," etc., etc. A knock at the door; a tall person answered the welcome "Come in" of our young lawyer. "Will you take a seat for a few moments. I will be finished soon," and on our lawyer went talking to his "client" (?) All at



Facsimile of advertisements that have appeared recently in daily and weekly newspapers.

once he hung up the receiver and asked his visitor what he could do for him, he only had about ten minutes to spare, as he'd just made an appointment with Mr Brown over the phone.

Our visitor, however, replied that he could do nothing for him, but that he was from the Telephone Company, and had just called in to connect the telephone up.

This lawyer was only like thousands of men who try to conduct their business without advertising. If advertising is anything, it is the connecting link between the seller and the buyer, no matter what the commodity be.

What would the plumbing trade have been if manufacturers had never advertised?

And look at those manufacturers who do not advertise. They are not in the progressive class. They have to sell their goods by sheer force, not by the power of suggestion; and force is the costliest of all elements that go to make up a man's business.

These non-advertising manufacturers may have made a certain amount of progress, but not by any means the amount they would have made had they been persistent advertisers, and at the same time lived up to the claims they had made in their advertisements.

But on the whole what is the position of the average sanitary and heating engineer? Why are there at least half a million homes in Canada that have no bathrooms installed therein? Our answer is that sanitary and heating engineers as a rule do not advertise. They appear to lose sight of the power of suggestion, and without fear of contradiction we may unhesitatingly say that the power of suggestion is the biggest power on earth.

The apple on the tree "suggested" that man should eat; the temperature suggests that we clothe ourselves; the storm suggests covering; in fact, all nature suggests something. What is more, this animal, man, wants. He wants with his first breath, but does not know what he wants. It is the same wherever man or beast exists; all is on the want. But very few know what is wanted in a real sense of the word.

The sanitary and heating engineer knows that if humanity is to live in houses these houses must be equipped with all manner of appliances. Then it is up to the sanitary and heating engineer to make suggestions.

How many housewives are there who do not want a first-class bathroom, a good type of laundry tub and fittings, and a well-planned kitchen? Very few. Yet how are the members of the trade catering to these very necessary wants? No suggestions for this kind of equipment, if made at all, have to be made by architects or others who know very little about this line. Who was it, we would like to know, who first suggested that laundries be placed in the cellar? Certainly not a sanitary engineer. Who is it that suggests that the bathroom be about 5 x 7 feet? Not the live up-to-date sanitary engineer. No, and a thousand other things which the craft should have looked after have been left to impractical men, jerry builders and cheap jack architects. And why all these silly short-sighted mistakes? Lack of practical suggestions, which is nothing but advertising. Like the young lawyer in the story told, the trade has not been connected, and are only pretending to be busy.

But we should not become too pessimistic; things are improving. Very few papers are there but we find one or two "plumbers" or sanitary and heating engineers' advertisements therein, and this is a hopeful sign. It shows that the power of suggestion is going to be used by the craft more in the future than it has been in the past.

SANITARY ENGINEER has called upon quite a number of those that are advertising and has been informed that "it pays to advertise," and if SANITARY ENGINEER can be of any assistance to our readers we will be only too pleased to do so by way of preparing specimen advertisements.

In the next issue we will prepare a few suggestive advertisements which may be used as a guide to advertising. Before concluding, however, we wish to impress every reader with this fact that everybody wants—wants something. And if they spend their money on bathroom and toilet requisites they will not have money for candy or for those things that do not make up more perfect civilization; yet everybody wants. Then it is up to sanitary and heating engineers to suggest some of those wants by using space in the local papers, and in that way get into daily contact with the public. Everybody wants. Sanitary and heating engineers want to advertise, and we suggest that they do advertise.

WATER FOR WESTON SANITARIUM

York Township Engineer Reports Laying of Water Mains to North-west City Districts

Mitchell & Mohan have secured contract for $1,331 for the laying of 1,900 feet of six-inch main, needed to supply water to the Western Sanitarium from the present laid as far as Buttonwood Avenue on the Weston Road. This action has been pending for some time but was finally taken on the urging of Dr. Dobie of the Sanitarium who pressed upon the York County Council the necessity for an adequate supply of water at the institution. The pipes for the extension were purchased some time ago.

The engineer was authorized to undertake the laying of no more house connections until spring. He reported the procedure with the work of laying a twenty-four-inch main on Eglinton Avenue which is to be the source of supply for the district west of the city and north of St. Clair Avenue. He stated that already water was being supplied in the Baby Point district and on some of the streets in Oakwood and Wychwood where the mains are connected with the St. Clair ave. service pipes.

FROZEN SERVICE PIPES

The following letter was recently addressed to the Editor of the "Ottawa Journal-Press" by a citizen who appears to have some reason for complaining about frozen service pipes in that city:

Editor "Journal": If there is one municiptal service that requires prompt attention more than any other it is the branch of the water works department that is appealed to to thaw out frozen water pipes—not only on the street but to the basements of the houses where the service is delivered. At present the water works officials are over-worked—probably more than any other branch of the municipal service. They report that owing to the exceptionally severe spell of weather half the water pipes of the city are frozen. To meet the public demand for relief, the department has only three steam boilers. The first call on this small force is to see that all the street hydrants are in working order. Outside of this there are scores of urgent orders booked for immediate relief from frozen service and waste pipes. It would require at least six more boilers, with crews to work them, to overcome the distressing conditions that now exist. It is deplorable to think of the inconvenience and suffering of scores of families whose water service is frozen up and sinks, closets and baths are worse than useless. The Board of Control has no more pressing question to consider except that of the fuel supply, for immediate relief of a large section of the community.

ONE OF THEM.

Ontario Society Notes

The directors of the Ontario Society of Domestic Sanitary and Heating Engineers held a meeting on Jan. 14, 1918, in the Toronto committee room, President F. R. Maxwell presiding.

It was decided to forward all members the financial statement for year ending January 31st, 1918, and to also request their opinion as to the advisability of dispensing with the annual meeting, as was done last year, and to call instead a general meeting of the executive committee or or about Good Friday. Most satisfactory reports were received as to the society's financial condition, as well as regards other avenues of endeavor.

G. F. FRANKLAND, Secretary.

THEY were under heavy fire, and a Tommy in the front trench was continually rung up by a comrade in a back trench to know if he was all right. Wondering as to his friend's sudden anxiety as to his welfare he at last inquired the reason. "Oh," came back the answer, "you see I've drawn you in the sweepstake, and if you come out all right I shall win eight bob."

Reports of Toronto Society D.S. & H.E.

Chairmen of Committees Elected—New Members Initiated—Honorarium to Treasurer —Full Reports From the Chairmen of Various Committees

The annual meeting of the Toronto Society of Domestic Sanitary and Heating Engineers took place on Wednesday, January 16th, 1918, at eight o'clock, in the Canadian Foresters' Hall, 22 College Street.

The reports of the chairmen of committees for 1917 were received and the newly-appointed chairmen of committees for 1918 were announced, besides numerous other items of business that came before the meeting being acted upon.

Messrs. Charles C. Ormsby and John D. Smith were initiated and introduced to the members at this meeting.

The application of Lou. Palter was received and favorably acted upon.

Past President T. B. Smyth acted as chairman of the meeting in the absence of the president and president-elect, who had been called out of town.

1918 Chairmen of Committees and Boards

George Clapperton, Executive Committee.

George McGuire, Board of Trustees.

John Wright, Sanitary Committee.

Harry G. Waterman, Heating Committee.

Thomas B. Smyth, Arbitration Committee.

Fred G. Gentle, Apprenticeship Committee.

Kenneth B. Allison, Educational Committee.

Harry A. Farthing, Entertainment Committee.

John Wright, Legislation Committee.

Thomas H. Ferguson, Membership Committee.

E. Lewis LeGrow, Standardization Committee.

Frank R. Maxwell, Workmen's Compensation.

Treasurer Thomas M. Maxwell was presented with an honorarium of one hundred dollars and the best wishes of the members for the constant care and attention he has always given to his important office in the society.

The following reports were then submitted:

President Fred Gentle's report.

Treasurer Thomas M. Maxwell's report.

Secretary Garrett F. Frankland's report.

Auditors W. R. H. Daniels' and A. H. Read's report.

Sanitary Committee—Chairman John Wright presented his report at the last meeting, and presented for the attention of the members at this time the information given below regarding the new license regulations for plumbers.

Heating Committee—Chairman Harry G. Waterman's report.

Arbitration Committee — Chairman Thomas B. Smyth's report.

Educational Committee — Chairman Fred A. Wiles' report.

Entertainment Committee—Chairman Harry A. Farthing's report.

Standardization Committee—Chairman Wilfred E. Ramsey's report.

President's Report

As the year 1917 draws to a close, I would congratulate the members of this society on the fact that we are still in good organized shape and making progress, for you must remember we are still at war and going deeper than ever. In the reports of the different chairmen of committees, you will see just what progress we are making. One request I would make is that you attend your regular meetings better in 1918 as it would give your officers much more encouragement to work for your benefit. I take this opportunity of thanking the officers for their good work through the year, and I owe them an apology for not being with them on several occasions during the last six months, but I found it impossible to leave my business to attend.

Wishing you all prosperity and a Merry Xmas and a happy New Year and assuring you of my co-operation in all things for the good of the society, I am

Yours truly,
(Signed) F. H. GENTLE,
President 1916-17

Treasurer's Report

As your treasurer for 1917, I beg to submit for your approval my annual report of the finances of your society, which were as follows:

Receipts.

1916 balance	$ 23.72
1916 dues	45.00
1917 dues	2,800.38
Initiation fees	40.00
Interest	.22
	$2,909.32

Disbursements

Delegates' expenses	$ 33.00
1916 salary	180.00
1916 office expenses	23.70
1917 salary	1,300.00
Rent	210.00
Ontario Society	190.00
Printing	129.50
1917 office expenses	118.47
Telephone	52.00
Light	8.22
British Red Cross	25.00
Members overseas	30.00
Balance on hand in bank December 31st, 1917	609.43
	$2,909.32

Thanking you for your continued confidence in myself and bespeaking for one and all pleasant and prosperous time in 1918, I remain

Yours truly,
THOMAS MAXWELL,
Treasurer.

Secretary's Report

As secretary for 1917, allow me to thank the members for their hearty support and officers during the past twelve months, and co-operation to both myself and your other if I may be allowed I would ask for your officers elect for 1918 that the same earnest support be accorded them in the coming year for the general good and welfare of the Toronto society in all its avenues of endeavor.

Let your one New Year's resolution be a resolve to boost at every opportunity and attend every meeting of the Toronto Society of D. S. and H. E. throughout 1918.

In this way will you be improving your own individual affairs, and assuring to your fellow craftsman that loyalty which he, in return, will be ever willing to reciprocate. The enviable position held by the Toronto society to-day, and the progress you have made to date was only possible through the untiring efforts of those who continued to persevere whether the other chap would or wouldn't, and now that you have secured unto yourselves the new license regulations, it behoves one and all to get together in deed as well as in word.

Thanking one and all for their assistance to date, and assuring you that I am yours to command at all times for the improvement of the craft, I am

Yours respectfully,
GARRETT F. FRANKLAND,
Secretary.

Auditor's Report

We have examined all the books, cheques, vouchers, orders and receipts of the secretary and the treasurer, and find same correct in every particular.

We beg leave to compliment the society on the splendid showing in this branch of the society, the work of both officers being most carefully attended to and accurate throughout.

The membership are also to be congratulated on the fact that all dues were paid in full for the year 1917.

Bank Statement being

Total receipts	$2,909.10
Total disbursements	2,299.89
Balance in bank	$ 609.43

All of which we respectfully submit as your auditors.

W. B. H. DANIELS.
A. H. READ.

Sanitary Committee

The letter from John Wright of the Sanitary Committee stated that, with reference to the query as to whether a plumber had to have any statutory place of business such as a shop as distinguishd from a dwelling house, it now remained with the issuer of licenses of the examining board to define a plumber's shop.

In reply to a query as to how many licenses would be required in the case of a partnership it was stated that the license should be taken out by one of the partners in the name of the firm, the other partners, if doing plumber's work, taking out a journeyman's license.

Licenses should be renewed by April 1st of each year.

Heating Committee's Report

As chairman of your heating committee, I beg to report that all matters pertaining to the heating branch of this society have been duly taken care of for the past year, and I am glad to say that the members have made some considerable use of your committee in asking questions and receiving advice on various topics which were more or less perplexing. I wish to encourage this procedure among the members as it gets them away from seeking advice from sources outside of our association, and encouraging outsiders to pry into their business.

The question of advocating the formation of heating by-laws has been more or less discussed from time to time and no doubt

will eventually mature into a set of governing rules, but for the present any final action in this matter has been largely delayed owing to conditions arising at the City Hall which did not permit of it being carried through at the present time.

There has been joint co-operation with Local 46 and your society for the preparation of examination papers for the passing of apprentices, which have been duly completed. The examination of the steamfitters' apprentices has been proceeding during the past year with much satisfaction, and we hope for still greater success along these lines. In connection with the above, I would suggest that the employers make further effort to have their boys attend the Technical School for the purpose of promoting their efficiency in the trade, both from a theoretical and mechanical standpoint. Allowing a boy an afternoon a week, or more, is not only helping the boy but is making a thoughtful mechanic of him which in the end is bound to benefit the employer to a great extent.

In regard to the question of supply houses and manufacturers protecting us with a trade discount, we have been fortunate enough during the past year to get a revision of discounts which shows us a 25 per cent profit if we sell at the regular consumers' price; or in other words, we are protected to the extent of 25 per cent. We do not consider this protection sufficient to enable us to run our business profitably and so are endeavoring to obtain a protection which would be satisfactory to all.

Thanking you for your kind favors and appreciation of my efforts during the past year, I am,

Yours respectfully,
H. G. WATERMAN.

Arbitration Committee's Report

As chairman of your arbitration committee for 1917, I take pleasure to report that a perfect harmony seemed to exist with our members, and any little grievance was always settled without having to call a meeting of the committee. Trusting the same condition will exist for the coming year, the committee and myself extend to you all the compliments of the season.

Yours truly,
T. B. SMYTH.

Report of Educational Committee

As chairman of the Educational Committee of the above society for 1917, I beg to submit the following report along with a few suggestions which I think might help our association. The past year educationally has been a very busy one for our society. Our much sought after library is not accumulating with the rapidity which we would like, in fact our book case is still unpurchased. This, however, should not discourage us as our one great aim at this critical time should be to study economy and self-sacrifice. The boys we call our own across the sea will need every last dollar we can muster to help them speed along the longed-for day when peace will be universally declared. In my last report I made a request that a period of our regular monthly meetings be taken up with a lecture or talk on educational matters pertaining to our craft. The request was very kindly granted by your executive and the committee told me to get busy, which they did with much vengeance. Mr. McGlulick, accountant for Keiths, Limited, gave a talk on a safe book-keeping system. A live business resale service was the next item of interest placed before our society. This was clearly demonstrated to us by Mr. Henderson, proprietor of the Henderson Business Service. There is no doubt that a resale business service is an absolute necessity for the betterment of the financial conditions of our craft. The members in need of such a service would naturally be those that do not embody in their business a book keeper or cost keeper. The fluctuating of the markets the past few years has made it almost impossible to omit mistakes in cost.

Overhead expenses. Father Time made a grave mistake when he originated that phrase, there is no such thing as overhead expense. Just to show the doubting ones the error of their way Mr. Garret F. Frankland, esteemed secretary of our society, stepped into the breach to save the situation.

We have had very good success with regard to our North Ender Section. Your secretary keeps continually harping on it, in fact one would be lead to believe that it was his pet hobby. Mr. North Ender, you have every right to be proud of your achievements, not only for yourselves but for the whole society. This group of men began operations a little over a year ago. It is really surprising what can be accomplished in so short a space of time.

The compiling of the prospect list alone is invaluable to the members of this society. Any member hustling for new business just needs to consult his prospect list. It will be the means of making dollars for its members where before its organization they stood to loose money.

A resale price book was adopted to the satisfaction of all. It has been a means of recompensing those in a just way for the constant effort they have put forth to at all times please their clients.

If for no other reason than bringing together the members of the north end of our society this club has been and will be a great benefit. If signs are any indication of the times Mr. North Ender beware for the West Enders are organizing with a vengeance. It has already been rumored they are good providers. We hope the time will come when they will be in a position to give us some very valuable information. We wish them every success.

This organization will only be an incentive to make the members of our organization work more earnestly and enthusiastically to become as perfect an organization as possible for the benefit of ourselves and our fellow workers. I can see a great benefit in this organization for us, individually and collectively and I hope we will continue and meet with the greatest of success.

FRED A. WILES.

Report of Entertainment Committee

As chairman of Entertainment Committee, I herewith report that for entertainment in the year 1917 we have not covered ourselves with glory, but this committee deemed it best, inasmuch as the whole world is at present in the throes of the mightiest struggle the world has ever known, for our society to carry on entertainments only as a little break in the sombre time. We are pleased to report that for the year 1918 we have arranged a trip to our Buffalo brothers of the craft on Jan. 24th, and also hope to receive a return trip later on. We also wish to know the feeling of the members in regard to forming a 5 pin team for the N., S., E., and W. ends of the city during the winter months. I also wish to thank the officers of your executive for the able and amiable manner in which they have carried on the business for the year 1917. During the year several items have been put through which will be very valuable to the trade for all time to come, and are indeed a tribute to the zeal with which your officers hung on until they had accomplished that which they set out to attain.

Again thanking you and wishing the society a prosperous year,

I am Gentlemen,
Yours respectfully,
H. A. FARTHING.
Chairman Entertainment Committee

Standardization Committee Report

As your chairman of Standardization Committee for 1916 and 1917, you, no doubt, desire a word or two as to my stewardship of the duties entrusted to me during that time.

While I will say the field for work and effort of any of the members is endless in the matter of standardization in our particular line of endeavor, I only need to mention the following to show that some progress has been made by our society along this line in the past two years.

First, the standardization of price is one of the most important features to each one of us, and will bring about a clearer viewpoint on the part of the consumer to the point of acknowledging our ability and work, in other words, the adoption of a uniform resale price by our craft for its commodities to the consumer will bring to us all the customer who appreciates our ability to render him service with knowledge.

Standardization of materials as used by our craft has ever been before us and never so much as to-day, which demands such conservation of all materials as was never deemed possible in the past.

That this will all work to the general good in the times that are before us, is our sincere wish.

The standardization of a suitable style of public comfort station that would be adaptable to all conditions, being both sanitary and economical as well as attractive, is one of the increasing needs of our own city, as well as every community throughout Canada.

This matter is one of such importance to my mind that it could be well presented to the conservation commissioner of Canada, at Ottawa, for his consideration, now that hotel accommodation is becoming such an acute question through the new license regulations.

If I may be permitted to apologize for my shortcomings and those of my committee in not placing more tangible results before you for consideration at this the end of my term of office, allow me to do so, and also to congratulate the society on securing as my successor one of the most earnest, capable and respected members of the craft to carry on the work of your standardization committee.

Thanking one and all, I remain,

Yours truly,
W. E. RAMSAY,
Chairman.

An Irishman occupied Fred's chair in the barber shop recently, and he was drowsy. His eyes could not be kept open, his head rolled about and drooped over upon his shoulder and down upon his chest in a way that made shaving a difficulty for the knight of the lather and a dangerous one for the patient.

At last Fred said gently, but firmly:

"Look-e-here, sir, I can't possibly shave you unless you hold up your head."

To which the response was made with drowsy indifference:

"Well, thin, coot my hair."

The geography lesson was about to begin and the subject of it was France.

Accordingly, the teacher started off with the question: "Now, in this present terrible war who is our principal ally?"

"France!" came the answer from a chorus of voices.

"Quite right," said the teacher, beaming. "Now, can any of you give the name of a town in France?"

A small boy at the back of the class almost fell over in his eagerness to tell. "Somewhere," he said, breathlessly.

LITTLE Mary had been sent to the store to get some flypaper. She was a long time in returning, and her mother began to feel a bit anxious.

Going to the door, she spied the little girl coming up the street, and said, "Mary, have you got the flypaper?"

"No, mother," cried Mary, "it's got me; but we're both coming together."

SANITARY ENGINEER

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H. T. HUNTER, - - - - - - - - - - - Vice-President
EDWIN NEWSOME - - - - - - - - Editor

VOL. XII. FEBRUARY 1, 1918 No. 3

MORE RESIDENCES BEING BUILT

IN our last issue appeared a small item of news entitled "Workingmen Built Homes." It showed that in the city of Toronto the building permits granted for the year 1917 were far greater in number than during the year 1916.

Now, to many an average reader the figures mentioned may not be of particular interest, but by sanitary and heating engineers they must be regarded from a different viewpoint.

For example, take the Union Station, valued at $3,000,000. For residential property the cost of plumbing and heating appliances installed complete amounts to approximately 15% of the total, providing hot water or steam heating be installed. So that if $3,000,000 worth of homes were built a matter of $450,000 would be required to provide for plumbing and heating.

Now, taking the above statement for granted, the fact that more workingmen's houses are being built is a very good sign, the outlook appears to be good all round for the plumbing and heating trade, but the trade will have to be ready to do the work when called upon.

Those who wish to be in the forefront must have their plans all worked out, they should have their stock in good shape and their tools and equipment O.K. Old tools and poor machines must be replaced with modern ones so as to be able to execute the work procured, in short order. Labor will be the scarcest no doubt, and wages will not come down as many people appear to think. No, what will be required most will be intensive production, skilled and otherwise. The average journeyman will do well to put a little more thought into his labors, so as to make it easier for the employer to pay the higher wages. Therefore, in conclusion, we would strongly advise that just as soon as the war is over and the period of readjustment sets in, both employer and employee join hands, as far as it lays in their power, to make every moment count.

HUMIDITY IN THE HOME

THE series of articles which have lately been published in SANITARY ENGINEER and of which the concluding one appears elsewhere in this issue describing various kinds of humidifying devices is worthy the close study of every member of the craft. Apart perhaps from the sanitary treatment of sewage there is no subject in connection with our domestic and community existence which is so vital and which has so important a bearing upon our health and well-being. And yet it would probably also be correct to say that there is no subject which is so much neglected and given so little consideration both by sanitary engineers and by the public in general. The average man who rents or who builds a house is, as a rule, careful to see that the sanitary arrangements as regards sinks, w.c.'s, bathroom, etc., are in good order. He also makes special enquiry with regard to the heating arrangements, size of furnace, and its capability of providing sufficient heat, but not to one in twenty will it ever occur to consider the dimensions of the water pan or its position in the furnace, whether at the bottom where it is practically useless, or whether higher up where water might evaporate with reasonable rapidity, although not in sufficient quantity to be of any use. It is a fact beyond dispute that the water pan in the average furnaces, placed as it frequently is below the level of the fire pot, is of no more real use for humidifying the air of the home than would one teaspoonful of water be in saving the life of a man dying of thirst. We do not propose, at the present time, to go over the whole story again in order to prove the importance of sufficient humidity in the air we breathe, but we would impress upon every member of the craft the propriety of considering whether he has, in the past, done all that he should have done in this matter. Have you, fellow craftsman and reader of these lines, taken care whenever you have installed a heating installation, whether hot water or hot air, to point out to your customer the necessity of having sufficient moisture in the air? In recommending this or that furnace have you ever considered the desirability of such furnace from this point of view? If not, rest assured that you have been lacking in the rendering of that service which it should be the aim of every self-respecting sanitary engineer to give.

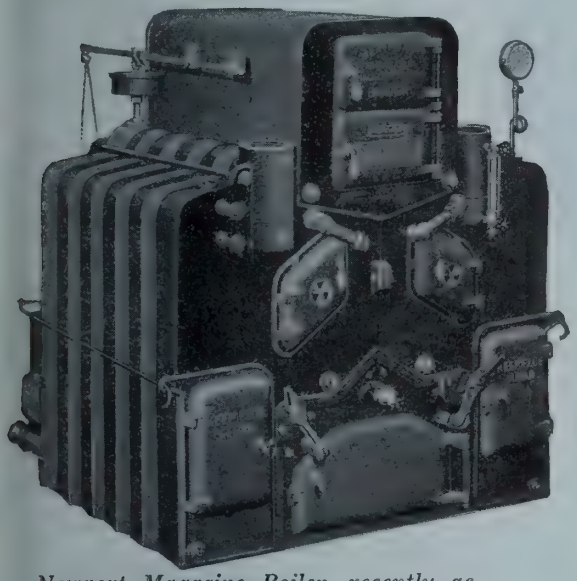
It is true that up till recently humidifying devices on the market have been few and little known and this may perhaps to some extent be regarded as a legitimate excuse for their non-installation, but the vital importance of having some means for supplying sufficient humidity in our homes is now fast becoming recognized and it behooves every member of the craft, not simply on account of the extra business he may thereby obtain, but from the desire which should possess him to give his customer the best possible service, to urge the necessity of making provision to that effect, whenever heating apparatus is installed.

New Sanitary and Heating Goods

A NEW SMOKELESS BOILER

While not exactly a novelty the Newport magazine boiler is comparatively new in Canada. There can be no doubt of the fact that more attention is being paid to boiler construction these days than ever before in the history of heating boilers. This has been brought about largely because of the need of conserving fuel, and by the shortage of labor.

Then there is more attention being given to the smoke nuisance, which in



Newport Magazine Boiler, recently acquired by the Lord & Burnham Co., St. Catharines and Toronto.

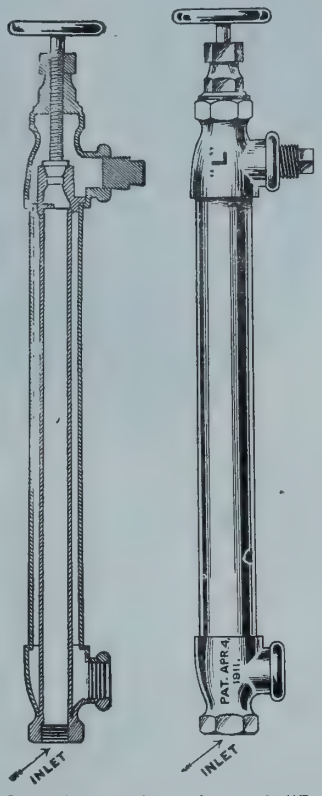
reality is a waste of fuel, so that the advent in Canada of another new smokeless boiler, the Newport, will no doubt be appreciated by the trade.

The Canadian manufacturing rights and patents have been procured by Lord & Burnham of Toronto and St. Catherines and we have been led to believe that at no very distant date deliveries will be made from their factory at St. Catherines, Ontario.

Full particulars may be had by applying to thir head office, Royal Bank Building, King St., Toronto.

THE LONG STEAM TRAP

Simplicity combined with efficiency are the two essentials in the successful operation of any piece of mechanical equipment, and this is increasingly emphasized where there is a possibility of certain parts of the mechanism getting out of order and thereby destroying or seriously affecting its usefulness. Wherever steam is used it is very important to instal traps at certain points to prevent the formation of condensation in the pipe line; both as a feature of effective operation and also as a factor of economy. The accompanying cut illustrates a simple device for freeing steam pipes or condensation, the limited number of its parts minimizing the danger of unsatisfactory operation, through the disarrangement or failure of movable portions. The operation of this trap is controlled by the expansion and contraction of the thin inner tube, acted upon by the variation of the steam and water



Sectional and exterior view of "Long" steam trap with optional outlets.

temperatures, the construction being so sensitive as to operate at a variation in temperature of one degree. A feature of the trap is that it can be installed in any position to suit the layout of existing equipment, but where it may be subjected to freezing temperatures it is necessary to instal it in a horizontal draining position, to insure continuous operation. One of the most troublesome conditions of steam distribution is the formation of air in the pipe lines, and the action of the trap here shown assures the expulsion of all air and water before the regular operation of the trap commences.

After the installation of one of these traps, the only necessary requirement is that steam be allowed to pass through freely until the entire trap is thoroughly heated, and, when such has been attained, the valve is set with just sufficient pressure to close the opening, so that, as the steam commences to condense, the slight decrease in temperature causes the inner tube to contract and permit the water to escape, and when steam again enters the opening is again closed. This continues regularly and indefinitely. Another advantage is that it will operate against pressure, as it may be desired to force the hot water to a higher level for specific purposes, such as the washing of bottles, etc. The two outlets are an added advantage to the trap, as it may be fitted as a small condenser without destroying its draining qualities. These traps are made in only one size, weighing approximately 5½ lbs., and are capable of draining the equal of from 1,000 to 1,500 feet of one-inch pipe. J. T. Long, 84 Adam Street, Montreal, is the manufacturer of this device.

FEW COPPER LICENSES

The United States Government has fixed its price on copper through the approval by President Wilson of the recommendation of the War Industries Board. This is really in continuation of the base price arrived at on September 21st, 1917. It will be continued in effect at the price of $23.50 per 100 pounds until June 1st, 1918, on the basis of New York freights. Government licenses are very much restricted, it is stated, as applying to Canadian importers. To the above price must be added freight and duty and above the laid-down prices an advance of 5 per cent. will be allowed. Licensees are required to give assurances that the exact spirit of the agreement will be maintained. Measures are also undertaken to prevent any speculating in the product.

MERCHANTS MUST PAY INCREASED CARTAGE CHARGES

In response to a complaint made by the Retail Merchants' Associations of Fort William and Port Arthur, the Dominion Railway Board has refused to grant an order denying the right of the cartage companies in these cities to increase their charges. It was maintained that the existing situation is a discriminatory one in that the practice of advanced cartage charges is allowed only in respect of a limited number of shipping points in Ontario and Quebec. The grievance is said to be one which is not within the powers of the Railway Commission to correct.

LOWER PRICES FOR BRITISH STEEL SCRAP

A new order reduces the maximum prices of British steel scrap, fixed by the Ministry of Munitions. On all classes, mixed or not with wrought iron or other material, except steel planings, turnings and borings, the price is changed from £5 5s. to £4 15s. per ton. Wrought iron scrap, mixed with steel or other material, is reduced from £5 5s. to £4 15s. per ton.

A Novel System of Plumbing

A Number of Radical Departures From the Generally Accepted Practices—A Matter Chiefly of Newly Designed Fittings—Making the "Roughing in" Somewhat Simpler and More Flexible.

A RECENTLY developed system of plumbing covering many sanitary features, is the Fiat system, invented by Mr. G. Albin Nilson, a Chicago master plumber. Although comparatively new, its simplicity, practicability, and sanitary characteristics have won for it the endorsement of many engineers, architects, and sanitarians in the United States.

The system has been tried out in a number of hospital buildings of the U.S. Government at the Great Lakes training stations, the Washington Hotel, Washington, D.C. (375 bathrooms); Pensharris Hotel, Harrisburg, Pa. (250 bathrooms); Johnson's Apartment Building, Streatorville, Ill., and a number of large hotels and apartment buildings in Chicago, for which it is specially adapted, but small installations give the same excellent results.

A glance at a typical installation of the Fiat systems, Figs. 1, 2 and 3, will show the characteristics of the system. It is said to take up less room than the regular plumbing system and does away with the nickel-plated traps under the fixtures; all that is visible of the traps and the waste connection is a bent piece of tubing extending only a few inches horizontally from the walls and a few inches vertically to the fixture. The



PROF. A. BATEMAN
Chief instructor of sanitary science and plumbing instruction at American School of Correspondence, Chicago.

bathtub waste is carried above the floor to the tub where the clean-out and trap are embedded only 4½ inches in the concrete floor when the building is of fire proof construction.

All running-screw connections and right-hand and left-hand threads are abolished and every fitting is made reversible and adjustable. This is said to not only reduce cost of the system, but the elimination of the running-screw connections and the adoption of hub connections with calked lead joints gives a uniform strength to all re-vent lines besides adding to the flexibility of the system and allowing free expansion and contraction to take place, which is very essential in all high buildings.

The general arrangement of piping, coupled with easy curves and angles in the fittings is said to obviate all danger of stoppages in any part of the system, and as the re-vent connections are vertical and continuous, vent stoppages through back flush cannot occur. It is claimed that siphonage is impossible and an adequate circulation of air through the whole system is accomplished. It will be seen by the illustrations that all excremental matter from the closet enters the stack in a downward vertical direction, which renders a stoppage from a local fixture very unlikely.

Another feature of the system is the closet Y, shown in Fig. 150. This connection with the vertical stack is pre-



Fig. 2.—View of the 5th floor of the Washington Hotel, F Street wing, showing the roughing in for 19 bathrooms. The building in the background is the U.S. Treasury, Washington, D.C.

pared for wrought-iron screwed pipe, while the opening receiving the closet is a hub connection provided with a 2 inch hub to receive the re-vent pipe, directly over the center of the outlet, thereby making adjustable the upper end of the bend receiving the waste from the bowl.

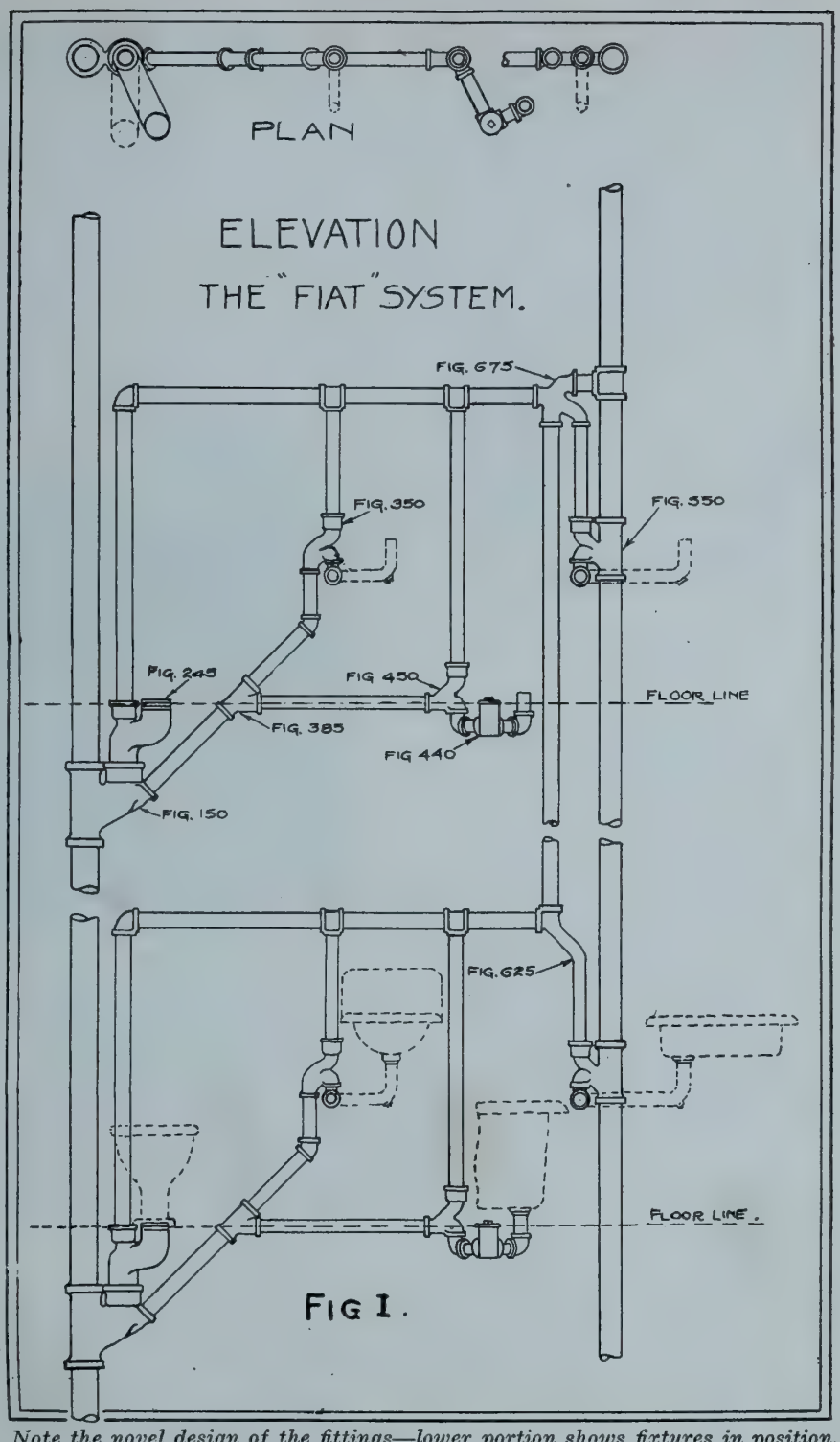
No matter at what angle the closet bend is turned, it will neither interfere with nor change the location of the connection for the re-vent. From this it will be seen that roughing-in measurements can be changed at will. Take as an example a closet bend 15 inches from the wall to the center of the inlet when at right angles to the wall. Assuming that a 12 inch instead of a 15 inch center is desired, simply move the stack either to the right or the left, then turn the closet bend to any angle giving the correct distance from the wall.

The lavatory fitting is shown in Fig. 4. It is furnished with a screw connection to receive the waste line, while a hub is provided to receive the re-vent, the joint being calked with lead.

The connection between the lavatory and the fitting is as follows: A drainage street ell is crewed into the tapped opening and a nipple is screwed into the street ell which extends about ¾ inch outside the plastered wall. A nickel-plated tube is inserted into the nipple and a slip-joint connection is made. The upper end of the tube is connected to the lavatory basin with a similar slip joint. A clean-out plug is provided in the heel of the tube which permits the water to drain out when so desired and renders the whole accessible. It is also claimed that with this form of water seal there is less likelihood of a stoppage occurring since, compared with the ordinary type of trap, there is only one-half as much bend to contend with, and the short horizontal run between the lavatory and the fitting is constantly filled with water.

Another feature claimed for this connection is that it can be turned to any angle to connect with the lavatory. It will be observed that the fitting is made in the shape of an offset which allows the lower end to be turned completely over to the right, thus gaining an adjustment of some 6 inches to meet the lower waste-pipe connections; this is executed without altering the center of the basin conection.

The bathtub trap, clean-out, waste, and vent are shown in Fig. 5. The horizontal waste line from the outlet of the fitting is installed above the rough floor



Note the novel design of the fittings—lower portion shows fixtures in position.

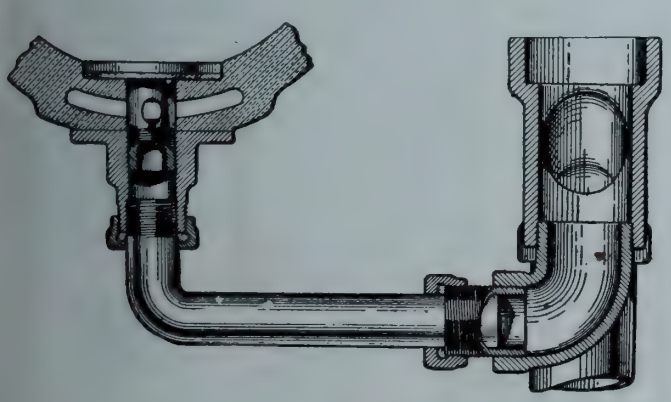


Fig. 4.

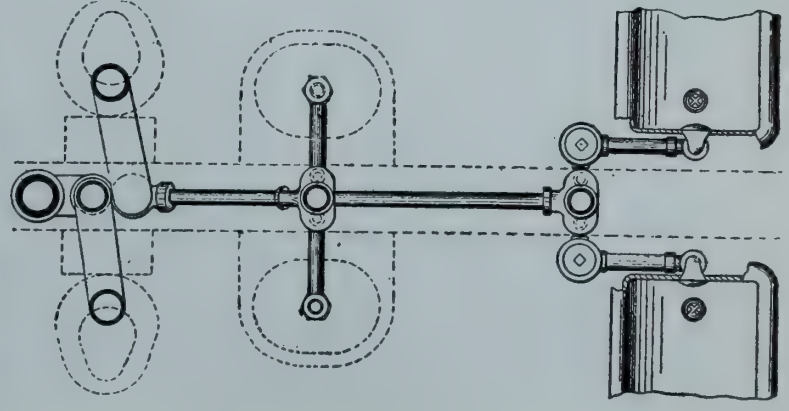


Fig. 6.

which, as already explained, is of importance where concrete floors are used. The fitting has a screw-joint connection for the waste outlet, while the upper hub receives the re-vent; the joint being calked, the screw connection for the lavatory fitting is abolished. The lower end forming the waste inlet is a tapped screw-joint connection with the drainage street ell. A drum with an accessible and removable screw cover is installed on a level with the finished floor between the tub and the waste and

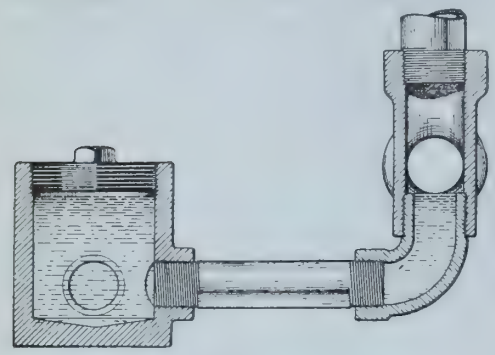


Fig. 5.

trap fitting which forms the water seal. The drum, or cleanout, extends only 4½ inches below the finished floor, which permits it to be installed in a 6 inch concrete floor slab without materially weakening it.

The sink waste pipe connections shown in Fig. 1, No. 550, are almost identical with those of the lavatory, the only difference being in the fitting itself. Both the upper and the lower ends in the waste line are made with screw-joint connections, while the hub is connected to the re-vent pipe by means of a calked lead joint. The lower end, receiving the waste from the sink, is a tapped-screw joint connecting with a street ell in exactly the same manner as the lavatory.

A rather unique re-vent fitting in the top story is shown in Fig. 1, No. 675. It is connected by means of a nipple into the main vent line of the waste stack, has four tappings to receive screw-pipe connections, and is so spaced as to make a vertical connection with the local vent from the sink and allow sufficient room for the vent line from the main stack.

The above description will give a general idea of the Fiat system. The special fittings are made for wrought-iron screwed pipe, for extra heavy cast-iron pipe, and for all special purposes, as illustrated in Fig. 6, which shows double back-to-back fixtures installed in one of Chicago's large apartment buildings. It will be observed that in this instance the usual partition divides the toilets and that special fittings meet the requirements of the two closets and the vents from them.

Arthur Bateman.



Fig. 3.—*Roughing in for an apartment house, Chicago.*

AWAKENING YOUR ENERGY

By W. Doolittle

THE life worth living, the life called real and purposeful, is one that is moulded and made by persistent striving and constructive energy. Swinging one's self forward daily with determination, forward and on a body animated and alive from head to heels.

We are not to be as vegetables that sprout up in the springtime of youth and wither and fall in the winter of life; living and breathing, and drawing substance; anchored in the same spot; without having made a single inconspicuous move.

Why Are You?

Look you deep, and consider well. The pangs of child-birth have been suffered and endured for you, not in order that you might be what you are now, but what you ought to be. Not in the lagging, bragging lazy-bone class, but, a living, wide-awake, alert, thinking human being.

You, who step into to-day, you of that class who are in the habit of wasting your time in listless endeavors, you, yourself, the human form that you are, awaken! The great energizing force within you calls you now to meet a challenge. A challenge direct from the great universe, not alone to give battle to the elements of earth and sky, but to push forward, forge ahead, and become an active, persisting, determined energized individual.

You are not to stand and stare; nor should your arms be akimbo or hang lifeless at your sides. But on these your sleeves should be rolled up; your spine fully straightened; your head and eyes clear; your nerves calm but vibrating; every part of your anatomy ready at all times to be brought into play. These are the pre-requisites to turn yourself from what you are now, into an ever-ready-to-thrust forward type of mortal.

We desire the good things, the luxuries of life; but instead of pushing forward and trying to obtain these by legitimate means, many live on the supposition or hope, that some day, someone, will be accommodating enough to die and leave them the wherewithal to secure these. The point to be emphasized is, that the thing worth the having, is worth the most energetic striving for. The mere thinking and wishing method has no place beside the man with unflinching power, whose superabundant energy is going to capture all that he most necessarily needs or wants. The great fault with the average of mankind is, that a little feeble expenditure of energy exerts such a strain upon one's ordinary efforts, that a two hours' relaxation is required for each hour's exertion. A slight bend of the back-bone requires a stimulant to put it back in place.

Many Are Lacking

Very few of us have that get-up-and-go, that swinging energetic gait, that

(Continued on page 27)

Importance of Humidity to Health

Air Washers Provide Scientific Humidification — Description of an Air Washer — Automatic Humidity Control — Process of Air Washing Eliminates Dust and Dirt From Air

Written specially for "Sanitary Engineer" by H. L. Seymour, B.A.Sc., A.M. Can Soc. C.E.

ARTICLE 7

IN the previous articles on this subject we have described the various humidifiers which are at present on the market, systems the efficiency of which for humidifying the air of the home has been tested and proved.

These humidifiers range in capacity from but one or two quarts a day up to three or four gallons per hour; some are suited only for the home or small office while others are adapted mainly for large factories and require compressed air or electricity for operation. Some of the humidifiers described are so arranged that the supply of water is regulated automatically by suitable tanks and floats. Many humidifiers are automatic in the sense that the colder the day, and hence by a physical law, the less, ordinarily, the amount of moisture in the outside air, the hotter do we keep our fires, with a consequent greater evaporation of moisture from the dependent humidifier. Other desirable features are embodied in some of the humidifiers such as provision for fresh air ventilation, for moistening ashes, etc.

Air Washers

This series of articles would hardly be complete without giving some little idea of air washers which provide for the scientific humidification as well as for the cleansing of air in large buildings.

"The need of an air-washer in connection with mechanical ventilation is becoming widely recognized. Not only must fresh air be delivered into buildings where people congregate but it must be pure, clean, healthful air. By the use of an air-washer the dusty, germ-laden air is cleansed, the poisonous gases removed, and the relative humidity may be mechanically controlled. Ideal atmosphere conditions are obtained within the building regardless of outdoor conditions."

All modern air-washers embody the same general principle. The air passes through a spray chamber where it is brought into intimate and thorough contact with water that is circulated and re-circulated from a large tank by the use of a centrifugal pump and spray system. The air is then passed over eliminators for final scrubbing and for the eliminating of the entrained water. (See Fig. 1).

An air washer generally consists of a rectangular sheet metal casing within which are arranged a series of spray nozzles of which there are several different designs. The object of these nozzles is to produce a sheet of fine spray of water over the entire cross-sectional area through which the air must pass. The water falls to a tank at the bottom, where it is drawn by means of the centrifugal pump, through a dirt strainer (which removes the dirt) and forced back again through the spray nozzles, the same water therefore being used over again. The amount which is carried away by the air is replaced by an automatic float valve in the tank, connected to a cold water line.

After the water passes the water spray it then flows through a set of baffle plates or eliminators. These have the effect of removing particles of water from the water spray carried along by the velocity of the air.

The ordinary type of air washer requires nearly eight feet of space to accommodate its length. According to C. A. Fuller, consulting heating engineer, the cross-sectional area should be such that the velocity of air is about 500 feet per minute, not including the space required by the tank at the bottom. To illustrate, if the quantity of air handled is to be 25,000 cubic feet per minute the area of the washer should be 25,000 divided by 500 or 50 square feet. Assume a height of 5 feet, the width should therefore be 50 divided by 5 equalling 10 feet. The floor area would be 10 feet wide and about 8 feet long.

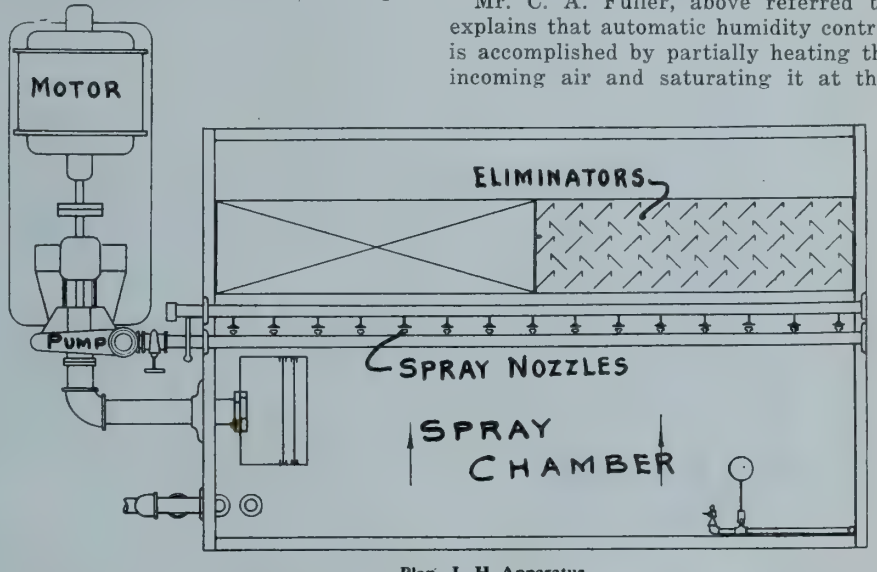
For the height, allow about 18 inches for height of the tank and 5 feet for the washer which makes a total height of 6½ feet. Although the length (about 8 feet) is usually constant, the height and width can usually be adjusted to meet space conditions.

In Fig. 2 there is shown the plan and elevation of an air washer and humidifier designed, it is claimed, to meet the very popular demand for a machine without all the refinements of the standard type but still combining a high efficiency and a low first cost and adapted for automatic humidity control during the winter months. The spray chamber in this type is but four feet ten inches long enabling it to be used in many places where space is at a premium and still giving sufficient room for the spray to completely cover the entire surface. The nozzles are uniformly spaced so the spray is uniformly distributed, and not less than 2½ nozzles are provided per each 1,000 cubic feet of air per minute. It is claimed that an adequate water filtering system is used in this type.

Automatic Humidity Control of Air Washers

Mr. C. A. Fuller, above referred to, explains that automatic humidity control is accomplished by partially heating the incoming air and saturating it at this temperature by passing it through the water spray of the washer. The air is then heated up to the desired room temperature and in this process of heating above the temperature of saturation the humidity is lowered to the proper amount.

Assume that it is desired to maintain a temperature of 70 degrees and a humidity of 60 per cent. From tables it can be found that for this condition the dew point is at 54 degrees. In other words if air at 70 degrees has a relative humidity of 60 per cent., at 54 degrees the relative humidity would be 100 per cent. or the aid would be saturated. To maintain a condition of 60 per cent. humidity at 70 degrees, the air must at



Plan—L. H. Apparatus

FIG. 1 — PLAN OF AN AIR WASHER

all times leave the air washer saturated and at a temperature of 54 degrees. The air in passing through the reheater may be heated above 70 degrees if desired to take care of the heat losses in the room. The air would enter then the room at a lower relative humidity than 60 per cent. but in cooling down to 70 degrees the humidity would return to the desired amount of 60 per cent.

The general arrangement of the Carrier humidity control system is shown in Fig. 3 The stem of a graduated thermostat shown at A (see Fig. 4) is placed in the passage just beyond the eliminators, so that it is exposed to the temperature of the air leaving the washer, and its expansion or contraction is caused entirely by this temperature and the variation due to its expansion is made to regulate this temperature.

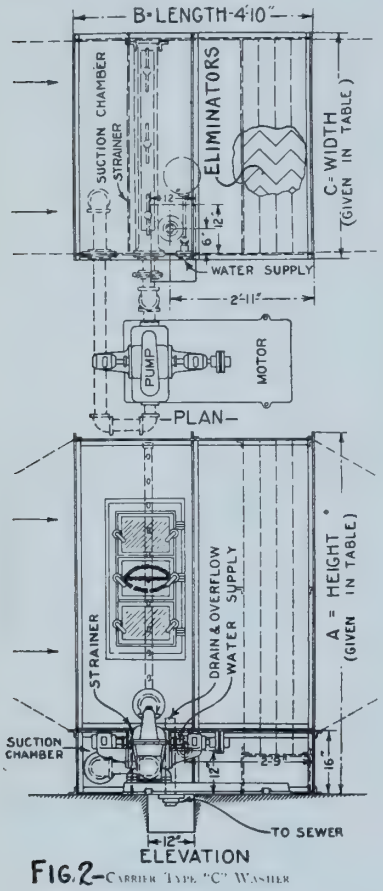


FIG. 2—CARRIER TYPE "C" WASHER

The water heater of the ejector type shown at B is placed in the suction line to the pump. The heater operates like a barometric condenser, so that the temperature of the spray water is varied by varying the amount of steam furnished to the ejector.

The diaphragm steam valve shown at C is placed in the steam line which supplies the water heater. This valve is operated by compressed air pressure from the graduated thermostat A.

The air compressor shown at D furnishes compressed air at about 15 pounds pressure to the storage tank E. The compressor is driven by the same motor that drives the spray water circulating pump G.

The reverse acting diaphragm valve shown at H is normally closed, but is opened by compressed air from the tank E, passing through the safety valve I.

It is claimed that this method is extremely sensitive, as any variation in the air temperature passing over the stem of the graduated thermostat produces a change in the air pressure on the diaphragm steam valve, causing the valve to partially open or close, thereby producing a new water temperature. "In only a few seconds this water is sprayed into the air, affecting its temperature, giving to it more or less heat in accordance with the requirements of the thermostat. This air in about one second passes over the thermostat stem, imparting to it the change in temperature, thereby completing the cycle. The system, while sensitive, is not frail or delicate."

Where steam is not available at a pressure of three pounds or over; that is, where a vacuum steam heating system or hot water heating is installed, an ejector heater cannot be depended upon for continuous and satisfactory service. In such plants a closed water heater (see Fig. 5) is substituted for the ejector. The water passes through the tubes at a high velocity, insuring a high efficiency of the heating surface, the steam or hot water medium being on the outside of the tubes.

In the argument for air washers it has been said:—

"In our cities the amount of solid matter carried in the air is enormous. The greater part of this consists of soot or unconsumed carbon from soft coal burning furnaces. In addition to this, all manner of impurities from the surface of the streets and sidewalks are kept in circulation by air currents. Dust and dirt brought into the building are usually evident on the walls and ceiling in the vicinity of a fresh air register or by the dust deposited on the furniture. Each year thousands of dollars worth of fine goods are ruined on the shelves of stores by this means.

"In the great majority of cases the location for the fresh air inlet at the basement level, either through basement windows or through sidewalks openings, is most convenient and inexpensive but without some sure means of purifying it the most thoughtless owner would not consider delivering into his building loaded with the scum of the street."

The arguments for a proper percentage of humidity (which it is also the function of an air washer to provide) in large buildings is evidently the same as in small buildings. In this latter connection many reasons have been advanced in these articles now concluded. Some similar reasons are here presented written particularly of the larger buildings, but applicable to any dwelling:—

"In schools and other public buildings, the humidity of the air is of more consequence than is usually supposed. It is the extreme dryness of the air in a heated room which produces many of the discomforts commonly noticed but not fully explained, such as extreme thirst, a parched feeling in the nose and throat, lassitude and headache. The effect of this extreme dryness is undoubtedly very harmful to the mucous membrane in nose, in throat and the lungs, and may be considered a contributing source of many throat and pulmonary diseases.

"And from a hygenic standpoint the relative humidity affects the mucous membrane of the nose, throat and lungs. Dry air readily absorbs moisture from the skin, drying and cracking the delicate tissue and frequently causing throat irritation and consequent coughing. The injurious effect on the mucous membrane is especially aggravated by a wide in-

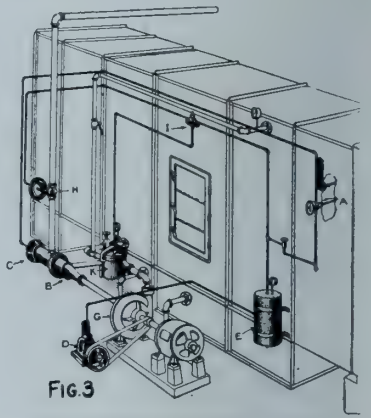
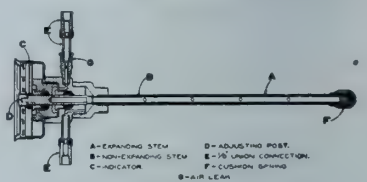


FIG. 3

CARRIER DEW POINT CONTROL WITH EJECTOR WATER HEATER



SECTIONAL VIEW OF CARRIER DEW POINT THERMOSTAT

FIG. 4

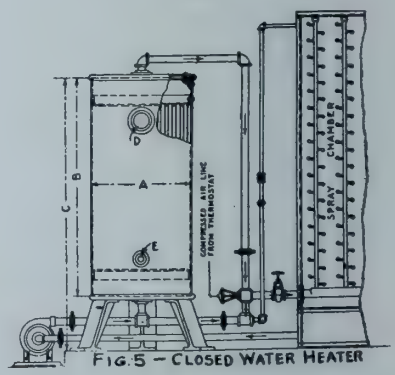


FIG. 5 — CLOSED WATER HEATER

door variation in humidity. In fact, the theory has been advanced that a copious supply of fresh air at a constant temperature and a fixed humidity in a sanitarium would do much for the cure of lung, throat and nasal diseases, as much, for instance, as the comparatively fixed weather conditions in Arizona."

We can heartily agree with the medical fraternity that some means of artificially increasing the humidity in our homes is not only desirable but necessary. "The engineer's province is to provide apparatus, appliances or means to furnish the results which the physicians specify."

Market Conditions and Tendencies

Statements Regarding the Prices and Trend of Supplies.

IMPORTANT changes have been made in a downward direction in some lines with which the plumbing trade has intimate interest. Corrugated iron, conductor pipe, eavetrough, elbows, metal siding, metal shingles, black steel sheets have all been reduced. Lower prices in these commodities have been induced through the desire of the manufacturers to foster trade that had been frightened away through the high prices. Declines were also registered in black sheets and galvanized sheets in some quarters. Higher price was made effective on cast iron plugs through the changing of the discount.

New sheets have been issued for wrought iron pipe since the issuance of change on January 7. There is no change in prices on new sheets but some lines were added which had been omitted in the previous sheet. Manufacturers of wrought iron pipe report a much better demand from new sources for their product. In this respect conditions appear to be opening more favorably for the spring trade.

In some quarters there has been a big demand for range boilers and other plumbing lines for repair work. Severe weather conditions of the past few weeks have kept plumbers busy making repairs. Travelers for wholesale houses have been hampered in making their calls through the tie-up on the transportation lines.

Ingot metals, such as tin, copper, lead, spelter, have held in steadily firm market. Pig lead shows a tendency to advance in the primary markets. Tin is a scarce commodity with prices steadily maintained. Solder wire was slightly higher but other lead and zinc products were maintained in steady position. Trade for wholesale plumbing houses has been good during the past two weeks, largely through the severe weather conditions.

TORONTO, Jan. 30.—The plumbing trade has been kept busy during the past two weeks as a result of many freeze-ups with consequent bursting of pipes and radiators. This has meant an active demand for repair materials. Plumbers have had to work overtime in many instances to meet the calls that have been made upon them. Booking business in some lines pertaining to the plumbing trade indicates that at least a fair measure of business will be transacted for Spring delivery. Transportation difficulties have interfered with business conditions within the past two weeks. Stock-taking is now about completed and orders in some lines are beginning to come through as a result of need of dealers to replenish their supplies.

Range Boilers Have Been In Good Demand

RANGE BOILERS.—There has been a good demand for range boilers in some quarters within recent days. Wholesalers are of the opinion this demand is coming by reason of necessary repairs where the sereve weather has caused damage and necessitated new installations. The problem of supplying the trade with range boilers during the coming year is now one of serious concern with the manufacturers. Owing to the embargo placed on heavy steel sheets which were formerly used in the making of the ends of range boilers manufacturers are face to face with a problem. They have been making costly experiments in reinforcing lighter sheets. It is asserted that the ends of boilers can only be so strengthened at a considerable addition to the manufacturing cost. It is probable this factor may eventually work out toward higher prices. Endeavors are now being made in order to get manufacture along these lines started. In the meantime prices hold unchanged.

	Standard	Extra Heavy
30-gallon range boilers....	$13.00	$17.00
35-gallon	17.00	20.50
40-gallon	20.50	24.00
52-gallon	28.00	32.00

Some Booking Business Reported On Enamelware

ENAMELWARE.—Manufacturers report there has been a fair amount of booking on enamelware for delivery in Spring of this year. This is the first indication that conditions are shaping toward fairly good conditions with the manufacturers. Difficulty is being experienced in securing supplies of some raw materials. Travellers for wholesalers and manufacturers have been unable to make their rounds with the same regularity owing to the storm conditions and this has perhaps had an effect in restricting booking business to a certain extent. Prices hold unchanged during the week.

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Sinks, roll rim, 18 x 30 in., staple.....	16 80
Closets, oak tank and seat	22 00
Do., enamel iron or white vitro tank...	23 75

Cast Iron Plugs Register An Advance

SOIL PIPE, FITTINGS.—An advance was registered in the price of cast iron plugs during the week as a result of the changing of the discount. Where formerly the discount was 30 per cent. it is now 25 per cent. Other lines of fittings held unchanged. There has been a fair amount of booking on soil pipe for March delivery and conditions in this respect have shown considerable improvement.

SOIL PIPE FITTINGS.

Medium and extra heavy soil pipe, 6-inch and under	35%	2½%
8-inch soil pipe	....	30%
Medium and extra heavy fittings, and under	40%	2½%

C. I. PIPE FITTINGS.

Cast iron fittings	....	15%
Cast elbows, tees, etc.	....	15%
Plugs	25%	
Bushings	30%	33%
Flange unions, standard	....	20%
Dart unions, ¼-inch to 2-inch.....	20%	25%
Do., 4½ in. and larger	....	15%
Nipples, up to 4-inch	....	45%
Do., 4½-inch and larger	....	40%
Do., running thread 4-in. and under	....	25%
Couplings, 4-in. and under	....	35%
Do., 4½ in. and larger	....	15%

MALLEABLE FITTINGS.

	Black	Galv.
Malleable Fittings, Class A, lb.....	0 50	0 63
Do., Class B, lb. net.....	0 22	0 33
Do., Class C, lb. net.....	0 15	0 22

Expecting Big Demand For Oakum

OAKUM.—Manufacturers of oakum in the United States are anticipating to see a shortage in this commodity before the close of the present year if the shipbuilding plan of the Government is carried through. The shipbuilding industry is expected to create the largest demand ever known in the history of the industry. One manufacturer stated when present stocks of raw materials are worked up and manufacturers have again to come into the market there will undoubtedly have to be an advance in price. The question of coal and power is also going to affect manufacturing costs. Canadian dealers have already sensed this trend of affairs through inquiry

which has already been made on the part of ship contractors. With a higher price for marine oakums the trend will be toward firmness in plumbers' oakum. In the meantime prices have held unchanged.

		Per 100 lbs.
Best American	....	$21.50
U.S. Navy unspun	....	20.75
Plumbers' spun	$8.50	10.00

Valve Manufacturers Still Actively Engaged

VALVES.—There has been no diminution in the demand for valves with the result that manufacturers in a number of instances are still working to capacity. With the coming of spring and an increase in shipbuilding activities it is anticipated this demand will be even heavier. Prices held in a steady position during the time since last issue.

	Discount off list
Ground work	50
Compression work, standard	52
High grade	45
Cushion work	46
Fuller work, standard	50
High grade	43
Basin cocks, No. 0 standard	46
Nos. 1 and 2	46
Bath cocks	53
Flatway stop and waste cocks, standard.	53
High grade	50
Roundway stop and waste cocks, standard	53
High grade	50
Brass steam cocks, standard	Net
Globe, angle and check valves, standard.	10
Do., removable seat	7½
Radiator valves, standard	15
Do., removable seat	10
Patent quick opening valves	35
Basin Cocks—	
No. 0 and 1, Fuller pattern	50
No. 0 and 1, compression	46
Midget	50
Globe, angle and check valves, medium pressure	30
Radiator valves, standard	30
Radiator valves, Jenkins disc	30
Radiator valves, quick opening	40

Heavy Black Sheets And Plates Decline

SHEET, PLATES.—A decline of $2 per 100 lbs. has been recorded in price of No. 10 gauge black sheet and in 3-16-inch and ¼-inch plate. This readjustment has been made in conformity with the fixed prices now prevailing in the United States market. There was a narrowing of the range of prices on lighter gauges of black sheets as will be noted by the range of quotations given below. Some of the higher-priced sheets have disappeared under stress of pressure by the lower-priced stocks that are now in this market. Similarly there was a lower range from the high quotations on galvanized sheets.

BLACK SHEETS—	Per 100 lbs.		
10 gauge	$	$10 00	$12 00
12 gauge	7 55	10 10	11 60
14 gauge	7 45	8 40	9 10
16 gauge	7 50	8 50	9 20
18-20 gauge	7 30	8 05	8 30
22-24 gauge	7 35	8 10	8 35
26 gauge	7 40	8 15	8 40
28 gauge	7 50	8 25	8 50
3-16-inch plate	10 25	....	....
¼-inch boiler plate	10 00	....	....
GALVANIZED SHEETS—			
10¾ oz.		$9 50	$10 50
U.S. 28		9 20	10 20
U.S. 26		8 90	9 90
22 and 24		8 75	9 75
18 and 20		8 60	9 60
16		8 45	9 45
14		8 35	9 35

Better Demand For Wrought Iron Pipe

WROUGHT PIPE.—Manufacturers report a much better inquiry for wrought iron pipe within the past two weeks. This is apparently coming as new business. The mills have been kept busy for some time past working on old contracts and the offering of new business comes as a new feature to the conditions in this commodity. New sheets were issued during the week but these were simply to make corrections by way of addition of lines that had been omitted on sheet of January 7.

WROUGHT IRON PIPE PRICES

Effective January 7, 1918

	Per 100 Feet	
Standard Buttweld—	Black	Galvanized
⅛ in.	$ 6 00	$ 8 00
¼ in.	5 10	7 23
⅜ in.	5 10	7 23
½ in.	6 46	8 03
¾ in.	8 17	10 29
1 in.	12 07	15 22
1¼ in.	16 33	20 59
1½ in.	19 53	24 61
2 in.	26 27	33 12
2½ in.	42 12	52 94
3 in.	55 08	69 23
3½ in.	69 92	86 94
4 in.	82 84	103 00
Standard Lapweld—		
2 in.	29 43	35 71
2½ in.	43 88	54 11
3 in.	57 38	70 76
3½ in.	71 76	89 70
4 in.	85 02	106 28
4½ in.	96 52	121 29
5 in.	112 50	141 34
6 in.	145 90	183 36
7 in.	190 40	238 00
8 L in.	200 00	250 00
8 in.	230 40	288 00
9 in.	276 00	345 00
10 L in.	256 00	320 00
10 in.	329 60	412 00

Prices Ontario, Quebec and Maritime Provinces.

Corrugated Sheets And Conductor Pipe Decline

CORRUGATED SHEETS, CONDUCTOR PIPE, EAVETROUGH.—Substantial declines were recorded in the price of corrugated sheets during the week, ranging in amount from 50c on the lighter gauge to $4 per 100 square feet on heavier gauges. Discount on this line is 7½ per cent. Ranges of new prices will be found hereunder. Eavetrough, conductor pipe, elbows, shoes, and similar lines have also declined in price through the changing of the discount. Where formerly these lines were quoted at net list they are now quoted at 10 per cent. off list. Metal siding and shingles have declined from 50c to 75c per square. Standard galvanized shingles are now quoted at $10.25 per square, standard painted shingles at $8 per square. Standard galvanized siding metal is $8.75 per square and standard painted at $7 per square. Metal siding and shingles are quoted at 7½ per cent. discount from above list prices. Metal ceilings are also down 10 per cent. Decline has been due to desire to foster trade that had been declining on account of high prices. At the new prices manufacturers point out that it is unprofitable business, but there is a sincere desire to keep trade moving and not shut off the demand entirely.

TORONTO—	Galvanized Per 100 Sq.	Painted Feet
No. 28 gauge	$ 8 70-$ 9 00	$8 00
No. 26 gauge	9 60- 10 00	9 25
No. 24 gauge	15 00-	12 00
No. 22 gauge	18 00-	15 25
No. 20 gauge	21 00-	18 50
No. 18 gauge	27 00-	24 00

Discount 7½%.

Boiler Tubes Only In Limited Quantities

BOILER TUBES.—The market held in the status quo during the week, namely, no supplies of boiler tubes are available except under special permit from the Government at Ottawa. Prices held unchanged.

	Per 100 feet	
Toronto—	Cold drawn	Lapweld
1 inch	$36 00	$ ....
1¼ inch	40 00	....
1½ inch	43 00	36 00
1¾ inch	43 00	36 00
2 inch	50 00	36 00
2¼ inch	53 00	38 50
2½ inch	55 00	42 00
3 inch	64 00	50 00
3¼ inch	....	58 00
3½ inch	77 00	60 00
4 inch	90 00	75 00

Solder Wire Advances 1c Pound During Week

LEAD AND ZINC PRODUCTS.—Solder wire advanced 1c per pound during the week to 46c, due to the firmness in the basic raw materials. Other lead and zinc products held unchanged, with a fair demand reported.

Lead pipe, lb.	$ 0 14	$ ....
Lead waste pipe, lb.	0 15	....
Lead traps and bends	Net list	
Lead wool, lb.	0 16	
Lead sheets, 3 to 3½ lbs. sq. ft., lb.	0 13¼	
Lead sheets, 4 to 8 lbs. sq. ft.	0 12½	

Cut sheets, ¾c lb. extra, and cut sheets to size, 1c lb. extra.

Solder, guaranteed, lb.	0 42½	....
Solder, strictly, lb.	0 39½	....
Solder, commercial, lb.	0 36¼	....
Solder, wiping, lb.	0 38½	....
Solder, wire, lb.	0 46	....
Zinc sheets, per lb.	0 26	....

Heavy Lead Pipe Up; Old Rubber Goods Down

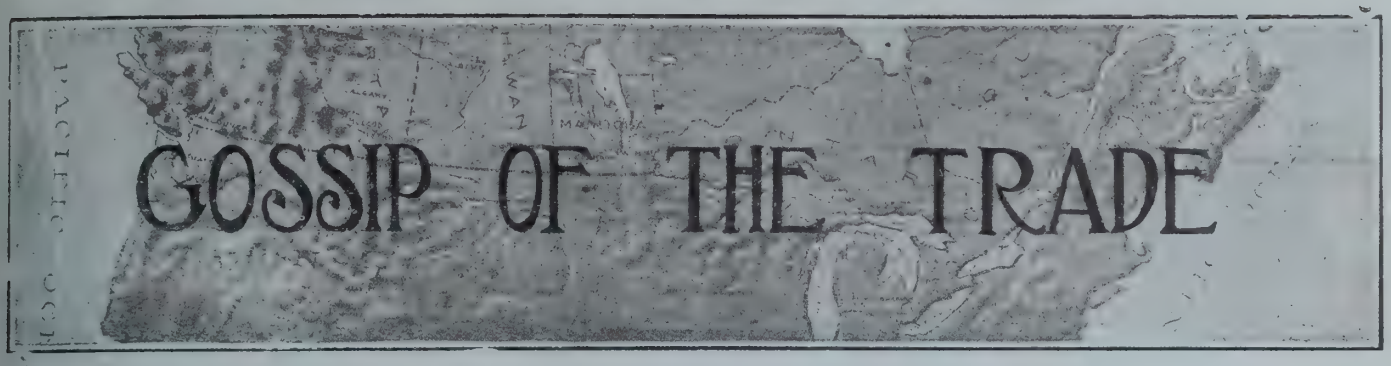
OLD MATERIALS.—An advance of ½c per pound was offered by wholesale dealers for heavy lead pipe, now making the price 6½c. There is a measure of firmness in this metal, due to a better tone to the primary market for ingot lead. Old rubber boots and shoes, on the other hand, showed an easier tendency, prices being quoted down ¼c at 7¾c per pound. There is very little buying at the present time, as those who have old materials are inclined to hold for higher prices.

Tea lead	$ 0 04½	....
Heavy lead pipe	0 06½	....
Yellow brass	0 12	0 13
Red brass	0 20	....
Light brass	0 09	....
Heavy zinc	0 05½	0 06
Heavy copper	0 20	0 21
Stove plate, per ton	17 00	18 00

Tin Market Firm With Good Business

INGOT METALS.—There was better inquiry for tin and antimony during the

(Continued on page 28)



TO LAY WATER MAIN

York Township Council are preparing specifications for trenching and laying water main in Buttonwood Avenue.

OBITUARY

Wm. Earle, C.E., recently district engineer for the Dominion Government Department of Public Works in Manitoba, died recently in St. John, N.B.

OFF TO BUFFALO

Twenty-five members of the Toronto Society of D.S. & H.E. journeyed to Buffalo, N.Y., on Thursday, January 24th, 1918, by special C.P.R. car to visit the Buffalo Master Plumbers' Association.

WORK CONTEMPLATED

Armagh, Que.—The Town Council have plans prepared for waterworks costing $40,000.

Picton, Ont.—The municipality proposes to instal motor-operated centrifugal waterworks pump of 1,000 gal. per min. capacity.

TORONTO VISITORS

Mr. John Marshall, of Port Arthur and Twin City fame, was a visitor of Secretary Frankland during the week.

Mr. Robert McG. Coyle, of Chatham, chairman of Sanitary Committee of the Ontario Society, was also a visitor at the office of the society this week. Both report craft conditions very brisk in their respective home towns.

VOTE SOON ON EXTENSIVE SEWER SYSTEM

Within a month six Canadian border towns will vote on the instalment of a common sewer system costing $250,000, as part of the plan for a general sewage and water system for the entire community. The towns included in the arrangement are Ford City, Walkerville, part of Windsor, part of Sandwich, Ojibway and Sandwich West.

OPPOSE HAMILTON WATERWORKS APPROPRIATION

The Hamilton Board of Control has been informed that T. J. Stewart, M.P., and the local Senators will oppose any application made by that city to the Finance Minister for permission to issue debentures to cover the cost of the new pumps ordered for the waterworks. Mr. Stewart has opposed this scheme and recently announced that an auxiliary electric supply could be obtained to operate electric units. A deputation has been sent to Ottawa to interview the Finance Minister and secure his permission to issue the debentures.

WORKS AUTHORIZED

Galt, Ont.—A by-law has been passed for extension to waterworks system at a cost of $18,558.

Stellarton, N.S.—An extension to sewer line in the south end of the town has been sanctioned by the ratepayers.

Toronto, Ont.—The following items have been included in the Board of Education estimates for 1918; new plumbing $5,000; providing and improving heating and ventilating apparatus $4,000.

"PASSED ON"

With the "passing on" of Mr. Andrew Lee the sanitary and heating engineers of the west have lost an able assistant.

He was a pioneer plumber and well known to all the master plumbers and heating engineers in the west.

He was at the time of his departure the president of the Western Supplies Limited, Edmonton. SANITARY ENGINEER joins his many friends in expressing their heartfelt sympathy to those he has left behind.

GOVERNMENT SANCTIONS BIG APPROPRIATION

The water board of the Greater Winnipeg Water District will be permitted to float bonds to complete the work on the projects planned for 1918. The board will require $4,000.000 for its work this year. Mayor Davidson and the commissioners went to Ottawa in order to obtain governmental sanction for the issue of the necessary debentures. The following year $2,000,000 will probably be required.

TO REMEDY ELECTROLYTIC ACTION ON WATER MAINS

T. H. Hoover, superintendent of water works at Winnipeg, has emphasized the necessity of remedial measures being taken against electrolytic action on the cast iron water mains in Colony St. and Cooper Ave. The pipes here were very considerably damaged by electrolysis and a settlement of the matter is now before the courts. Action has now been taken to remove the possibility of further damage of this sort.

PERSONAL

Captain R. J. Durley, M.E., Montreal, has been made a member of the Order of the British Empire. Captain Durley is by profession a consulting engineer, specializing in heating and ventilation.

Major A. G. Tweedie has been appointed city engineer of Sault Ste. Marie, Ont., taking the place of Mr. W. L. McFaul who has joined the army. Major Tweedie has returned from France after eighteen months in the trenches.

Captain Everall, who has received an appointment as assistant engineer with the Dominion Public Works Department at Victoria, is a returned officer with two years' service in France to his credit. Prior to joining the army he was engineer for the Dominion government at Pt. Arthur.

SHARE COST OF SEWER

The Essex Border Utilities Commission, in session at Windsor, Ont., has apportioned the cost of constructing a temporary sewerage system, which will discharge at a point below the Windsor and Walkerville water main intake pipes. The new arrangement means that Windsor will contribute $28,000 towards the cost of the new work, Walkerville $18,000, Ford $67,000, Sandwich $25,333, Sandwich West $28,333, and Ojibway $46 533. These assessments will be submitted to the various municipal councils for ratification before going to the Ontario Railway and Municipal Board for final approval.

LONDON SANITARY ENGINEER RETIRES FROM BUSINESS

Mr. Charles I. Needham, a pioneer in our business in London, Ont., is retiring from active business after a most successful career as one of the foremost men engaged in plumbing and heating in Western Ontario. Mr. Needham will reside in Montreal, and the best wishes of his fellow-members of the Ontario Society of D.S. and H.E. follow him in his retirement. May he be long spared to see the fruits of his labors garnered by the rising generation of sanitary and heating engineers, both in London and throughout the Dominion.

UNDERGOES OPERATION

E. Lewis LeGrow, an honorary director of the Ontario Society of Domestic Sanitary and Heating Engineers and member of executive committee of the Toronto

Society, was operated on for appendicitis on Thursday, January 17th, in the General Hospital, and while first reports were very discouraging, we are glad to announce that Lew is gradually improving, and our most earnest wishes for his rapid and complete recovery are being realized.

NOMINATIONS FOR BUILDERS' EXCHANGE

Walter Ryan has been nominated as director of the Montreal Builders' Exchange for the ensuing year. He will represent the Master Plumbers' Association of Montreal and vicinity. F. B. Locker, also a director, will represent the Tile Dealers' Association. J. P. Anglin, B.Sc., has been nominated for the presidency; R. F. Dykes for the office of first vice-president and W. M. Irving for second vice-president. John Quinlan is the retiring president of the Exchange.

WINDSOR LAID 43 MILES OF SEWERS LAST YEAR

The annual report of City Engineer Brian, Windsor, Ont., shows that during the past year the city laid 43½ miles of sewers. This construction included the Gladstone avenue sewer which has been completed and the Parent ave. sewer, furnishing an outlet for the east end of the city and which will cost approximately $38,000. The Parent ave. job will not be completed until the coming spring. In addition to these big trunk sewers, smaller ones, namely the Louis, Cataraqui and Montmorency, the Grove and Jeannette ave. sewers have been built, costing approximately $20,000.

REINFORCED CONCRETE PIPES FOR GAS

At the works of the Barnsley Smokeless Fuel Company, Limited, at Barugh, near Barnsley, Yorkshire, England, the works gas connections are mostly made of reinforced concrete. The pipes were made on the site by Messrs. Edmond Coignet, Limited, to the general specification of Mr. S. N. Wellington, consulting engineer at the Smokeless Fuel Company. The pipes are in 6-feet lengths and the walls are from 1¾ to 2 inches thick, according to the diameter of the pipe. The collars for the joints are also made of reinforced concrete. According to the November number of "Concrete and Constructional Engineering," to which we are indebted for these particulars: "The concrete was suitably graded and of a proper mixture to ensure both strength and density, and the pipes were very carefully made, in order to prevent all possibility of air bubbles or cavities. After they were cast and matured they were plunged in a bath of tar of a sufficient temperature to make it thoroughly liquid, so that the pipes should be permeated in every pore by this substance. This extra precaution was for the purpose of filling up any small cavity or pinhole which might have remained undetected. The pipes were then laid in the trench in the same manner as cast iron mains, and their ends were jointed by means first of a special joint of tow treated with pitch and cement."

A LETTER FROM FRANCE

France, 22-12-17.

The Secretary,
Society of Domestic Sanitary and Heating Engineers, Toronto.

Sir:

I have the honor to acknowledge receipt of parcels one this date—which is the army form of expressing oneself—and quite inadequate to the needs of the present case. A dandy fine parcel, Mr. Secretary, and does full justice to your good taste and judgment and I am sure to that of Mrs. Frankland also. The 2nd instalment mentioned in your letter has not yet turned up but will probably do so shortly.

'Tis a fine war we are having out here and if it weren't for the length of it in duration and distance from home and use of high explosives and bully beef and the fact that it is pretty nigh Xmas we wouldn't have any kick at all. 'Twould be a fine place for the D.S. & H. E. to set up a stand—truly the French idea of sanitation is an eye-opener—and a nose closer. Most charitable thing about the country is its everlasting manure pile, which they would keep in the drawing room if they had one, which they haven't—hence the front door steps. After a while you get used to drawing water from a pump fed by the manure pile. Heating arrangements too are very modern—pipeless system, you know—one keeps quite warm in summer time.

How is business? I suppose like the Hun—holding its own and perhaps a little on the side. I hope so.

My best thanks for your kindly thought and the evidence of it. Please convey my appreciation to the members.

Best Xmas and New Year's wishes to you all,

Sincerely,

G. A. KEITH.

THE HALIFAX DISASTER

The following letter has been received by G. F. Frankland, Secretary of the Toronto Society of D.S. & H.E., from J. E. Godwin, of Halifax.

The graphic account Mr. Godwin gives of his experiences of the disaster will arouse the sympathy of all for him in the losses he has sustained. The letter (in part) follows:

"You say you trust that I have been one of the more fortunate ones. Well, old chap, I am very fortunate in a way, having got lose from the centre of fire with my own life and also with the lives of my wife, maid, and five children, but lost everything else except the lot my house was built on.

"I was home at the time, at what was known as Russell Street, and when the thing went off it took with it the roof, front, back and east side out of my house. The wife, maid, two children and myself were in the kitchen, two children upstairs in bed, the other one having left for school a short time before. My wife and the maid were completely overcome; one little fellow had just taken off his sleepers and put on his inside shirt and was standing on the sofa dressing himself; he received a bad cut on the back from the flying glass and falling plaster; a little girl sitting in her high chair eating bread and molasses had her left eye cut completely out with flying glass, besides other cuts she received on the head and neck, myself being pinned on the floor beneath a large window frame and table. After I got myself from under cover, I pulled the wife and maid out and covered them up with a few cloths that I could find at the minute. By this time the front of the house was on fire and two children upstairs. I took a chance and went up after them, God only knows how. I found the little boy, three years old, blown out of his bed into the hall. I went right past him when I saw he was not hurt into where our five months old baby girl was sleeping, her room being on fire. I had to do some digging in the plaster and other material that had fallen in on her bed, but to my great surprise when I located her she did not have a scratch on her. I picked her out and went out into the hall and got the other little fellow, who was waiting for me, to hold on to my back, and away I went downstairs to the kitchen where the others lay. Fortunately by this time some assistance had arrived and the wife had come to her senses. I gave her in charge of two soldiers to take to the hospital, and they also took with them the little girl with the eye out. Two more soldiers took the maid to the hospital, and by this time my little girl arrived home from school unhurt. I then completed the job by taking one child on each arm and the other on my back, my oldest one walking with us, to a place of safety. So I consider I was very fortunate.

"I did not know I was hurt very much myself until a fellow told me my ear was cut in half and the back of my head was open. I had those few little things sewed up, but my back is very bad where I was jammed, and it will be some time before it will be right again. I am completely out of business for a while.

"Kindly convey to the trade my sincerest appreciation of their kindness shown to me in this terrible trouble, wishing them one and all the very best of prosperity for the coming year 1918."

CATALOGUES, ETC., WANTED

Editor, SANITARY ENGINEER,
Toronto, Ont.

The Toronto Society of Domestic Sanitary and Heating Engineers, 22 College Street, are desirous of having a more complete library of catalogues and trade information in general listed in their rooms, and would be obliged if you would give this announcement due publicity in the columns of your valued journal.

Thanking you for this valued favor, I remain,

Yours very truly,
GARRETT F. FRANKLAND,
Secretary.

CONTRACTS AWARDED

Moncton, N.B.—Thos. Johnson, Main Street, has plumbing and heating contract for $3,200 single residence for H. G. Wadman.

Halifax, N.S.—The city has let contract for rebuilding sewerage system, layout, etc., to H. P. Starrett Corp., 115 Broadway, New York City.

Hamilton, Ont.—P. A. Moore, 939 King Street E., has plumbing and heating contract for $6,000 double residence for E. Lambert, 221 Balsam Avenue.

Toronto, Ont.—Bennett & Wright Co., 72 Queen Street E., have plumbing and heating contract for $30,000 addition to aeroplane factory for Canadian Aeroplanes Co.

Chatham, Ont.—Purdy, Mansell, Ltd., 63 Albert St., Toronto, have plumbing contract in connection with the erection of a $40,000 bank for the Canadian Bank of Commerce.

Toronto, Ont.—R. Rose, 1349 Queen Street W., has plumbing and heating contract in connection with alterations, costing $10,000, to hotel for store for Sparrow estate.

Grantham Township, Ont.—S. P. Gourlay & Son, 31 King St., St. Catharines, have plumbing and heating contract in connection with the erection of an $18,000 school building.

Toronto, Ont.—Purdy, Mansell, Ltd., 63 Albert Street, have plumbing and steam heating contract for $75,000 restaurant, to be erected on Yonge Street, for Childs Co.

St. John, N.B.—F. S. Walker, 18 Germain Street, has contract for boilers, piping, pumps, valves, etc., valued at $38,500, for power house and laundry for the General Public Hospital.

Vancouver, B.C.—McDonald & Perry, 633 Smithe Street, have plumbing and heating contract in connection with conversion of hotel into stores for F. McIntyre, of W. H. Malkin & Co.

Vancouver, B.C.—Vancouver and Districts' Joint Sewerage and Drainage Board have let contract for cement, steel and brick sewer to Evans, Coleman & Evans, Ltd., Ft. Columbia, at a cost of $35,000.

AWAKENING YOUR ENERGIES

(Continued from page 20.)

forward going spirit, that buckles up and turns over obstacles. We spend much time in useless thought. And too much time in babbling talk. We know little of quietness—the great silence that moves steadily, uncomplainingly forward, that makes each action count for something useful and big. The best that was ever obtained, or ever will be obtained, fell in the right white palm of the man who went determinedly forward, and stood his ground till he got it.

You who sit and whine, you who despair, wake from your sleep. The day is far fetched. Things may look to you more hopeful to-morrow, but to-day, this very moment, if you choose to make it so, has more hopes that can be realized if you are only wise enough, know enough to turn your steps towards them. Your energy is the mainspring in the clock of your existence. And it has run down a long ways. A few winding turns will not give you much speed. You need a thorough winding, and that winding process needs to be enacted with despatch.

Deep in the marrow of your bones, along the entire length of your spinal column, your cords and sinews,—all that is within you of flesh and blood and soul, is one vast network of ripping, vitalizing human energy. Only the will of you, only the brain of you, needs to press the starting button to set in motion that force called energy. And that energy, be what it is, is bound by the propelling power of which it is composed, to force you ahead in unswerving, unrelinquishing epoch-making achievements.

Can that fact be driven home, deep in the core of that being you call self. That which to you is a human frame built on symmetrical lines. Endowed at the top with a thinking machine called a brain. Extremities called arms and hands that do your bidding, limbs and feet that propel you. Can you not awaken these to serve with greater energy, with greater power, with greater activity? Working towards some grand end, be it small or big, but working and incessantly working, striving each day towards accomplishing something, in putting the mark of your personality and name, indelibly and uneraseable upon that which your efforts expend.

FUEL SAVING "DON'TS"

By J. O. B. Latour, Chief Engineer, General Accident Assurance Co., of Canada Toronto, Can.

1. DON'T fill the furnace with the intention that there will be no necessity for any additional fuel for the next two to four hours. This is quite a common practice with heating boilers, and with bituminous fuel results in very great waste.
2. DON'T regulate the draft by closing the ash pit door, but regulate it with a damper in the smoke flue or pipe between the boiler and the chimney. This also applies to any kind of furnace.
3. DON'T allow any cracks in the brick setting of the boilers, because cold air will enter through these cracks and absorb the heat that should have been transferred to the boiler.
4. DON'T permit the use of grates of any kind which are in bad condition. This will permit the unconsumed fuel to fall through to the ash pit and be shovelled out as ashes or waste.
5. DON'T use a grate that is larger than will permit the burning of at least 12 lbs. of coal per sq. ft. of grate per hour.
6. DON'T permit any pipes or boiler surfaces to remain uncovered, unless it is necessary to transmit the heat through the surface of that pipe to the room in which it is located.
7. DON'T permit any joint in the boiler or any pipe connected thereto to leak.
8. DON'T permit any valve to leak which is located on a pipe supplied by the boiler. This is a very common source of loss. All valves should be positively tight when closed.
9. DON'T attempt to control the quantity of condensation to be collected from any pipe or other apparatus by hand control. There are a large quantity of good serviceable traps to collect these returns of condensation and they should be returned from these traps to the boiler.
10. DON'T permit any surface on the boiler exposed to the furnace heat to become covered with soot or ashes. The tubes should be cleaned at the very least daily.
11. DON'T use live steam for heating rooms, liquids, or other substances when there is exhaust steam from engines or pumps available. If the exhaust steam is not of sufficient temperature to heat the room, the liquids, or other substance to the required temperature, arrange your heating to be done in two stages; for instance, water could be heated to nearly 212 degrees by exhaust steam, then passed through to another vessel to be heated to the desired temperature with live steam.
12. DON'T feed a boiler with cold water when there is exhaust steam available to heat it. Every eleven degrees in temperature that feed water is raised by heating by exhaust steam there is a saving of 1 per cent. in fuel, and in winter time especially feed water is very seldom any warmer than 42 degrees. If this water is heated 212 degrees it will then effect a saving of 15 to 16 per cent.
13. DON'T allow the main steam valves on any engine or pump to leak. This is a very common fault, due to the fact that the leak is not seen.
14. DON'T allow the piston of any engine or pump to leak. This is also a very common defect permitted to go on day after day simply because the leak is not seen.
15. DON'T take it for granted that pipes that lead to sewers, blow-off tanks, or other places of discharge, are tight. If the pipe is warm between the stop valve and the source of discharge it will generally pay to investigate a little closer, because it generally is a sure sign of leakage, with great waste.

Distributed with the Compliments of the
CANADIAN MANUFACTURERS' ASSOCIATION

WORKS CONTEMPLATED

Sanguedo, Alta.—The C.N.R. will erect a new station shortly.

Toronto.—Theatre to cost $200,000 will be built by Marcus Loew.

Irma, Alta.—The erection of a hospital is contemplated by the town council.

Marysville, N.B.—Town Council contemplate construction of sewers costing $5,000.

Stellarton, N.S.—Site has been secured by the Bank of Nova Scotia for the erection of a bank.

Calahad, Alta.—A bank will be erected by the Merchants Bank of Canada. Site has been secured.

London, Ont.—The construction of the military hospital on the Odell property will be commenced in the spring.

Kananaskis, Ont.—The Dominion Government will erect immediately a tuberculosis sanitarium to cost $400,000.

Hamilton, Ont. — Moving picture

(Continued on page 30.)



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

A FURNACE TROUBLE

Editor SANITARY ENGINEER:

I would be pleased to have your opinion on the following matter and if possible a remedy for same.

I have a regular hot water heating system (Daisy furnace) in my store, which has heated satisfactorily for 10 years, but for certain reasons I was compelled to discard same for 2 years, so the system has been dry during that period.

I decided to start up the system again this month but have not been able to get half the heat I used to get in previous years. All the air has been positively expelled and the draft is perfect. I have also been very generous with the coal.

"Interested."

There is every possibility that some of the horizontal pieces of pipe have become partially choked, for example the furnace would dry out, as also would the piping and when the water was run into the system, all the lose scale and rust would likely fall from the vertical pipes into the various elbows and into the horizontal pipes, thus partially filling up the passage ways and interfering with circulation.

Then again the furnace will have rusted on the sections to a certain extent. This scale should be removed by scraping well. In case the scale appears to be hard and firmly adhered to the section, it can be loosened by making up a clear red bed of fire, first removing all soot and ash dust from the sections, then take about 2 lbs. of scrap sheet zinc clipped into small pieces about the size of a nickel, and spread quickly over the surface of the fire, see that there is no drafts on as it is the fumes from the zinc that is required and these fumes should not be drawn off too quickly by any superflous draft.

Regarding the best way to clean out the system, this can be done by attaching a hose to some point near the expansion tank and forcing water through the system and out at the bottom of the furnace, leaving the blow off cock at the furnace fire pot open.

Editor.

SIZE OF EXPANSION TANKS

Editor SANITARY ENGINEER:

Can you tell me if there is any rule by which to determine the proper size of expansion tank necessary for a hot water heating system. I have been in the habit of using one size of tank for all my jobs, but of course I have not installed any very large jobs. They were all within three hundred square feet of each other.

Also, how much water should there be in the gauge glass of an expansion tank when the water is cold?

"Steam Fitter."

As a rule most expansion tanks are too small and this causes the vent at the top to overflow and become frozen, as well as the water overflowing in basement. Then when this occurs the tank is liable to become closed at the vent on the one hand, or the water will disappear out of the glass when the system cools. Then the occupant is apt to fill up the system too full.

There should be never more than 3 inches of water in the glass when system is cool, this leaves room for the water when expanded by the heat.

The following is a good rule to adopt for determining the size of an expansion tank.

For 500 sq. feet or less allow one gallon of water to every 35 square feet of radiation.

For 500 sq. feet up to 1,000 sq. feet allow one gallon to every 45 to 50 sq. feet of radiation.

For 1,000 to 3 000 sq. feet allow one gallon to every 50 to 65 sq. feet.

For 3,000 to 5.000 sq. feet allow one gallon to every 65 to 70 sq. feet.

These are approximate figures and near enough for the average heating job.

Editor.

MARKET CONDITIONS AND TENDENCIES

(Continued from page 26.)

week. Lead was in firmer tone in the local market. Other ingot metals held steady, with business somewhat quiet.

COPPER.—While there has been no official announcement as yet that the price of copper in the United States is to remain at 23½c, it is generally accepted that this will be the basis for sale during the ensuing three months. The same system of allotment and distribution of production is to be followed. Prices were maintained in the local market, with demand reported fair.

TIN.—There was a good business reported in ingot tin in the local market during the week. Prices were maintained in a firm position as a result of the activity. In the New York market small lots were offered and commanded some fancy prices. London market held remarkably steady during the week.

SPELTER.—While negotiations have been under way with respect to fixing the price of spelter, nothing has been announced yet as to the result of these deliberations. It is generally conceded there will be no fixed price established for prime Western spelter. Market locally was quiet, with prices unchanged at 9¾c to 10½c per pound.

LEAD.—Quotations on lead were higher by ¼c per pound during the week from the lower levels, indicating the firmer undertone to this market. Prices ranged from 9c to 9½c per pound. There is not a heavy demand for this commodity at this time.

ANTIMONY.—Better inquiry was reported for antimony in the local market during the week, but prices held unchanged at 16c to 18c per pound.

ALUMINUM.—The market for aluminum held steady at 60c per pound, with an evenness of demand. In the United States market there was an easier tone and quotations were made 1c per pound lower than last week.

PIG IRON.—Producers are concerned over the transportation problem at the present time. There has been a serious hampering of movement of supplies by reason of the recent storm. The coke situation in the United States is reported as showing some slight improvement during the week, but the transportation situation nullifies any advantage that might accrue through better supplies. Prices held firm at $49.50 per ton for foundry iron.

1857 1918

SIXTY YEARS

of conscientious effort in designing and manufacturing

Brass Goods

have inseparably connected the name MUELLER with QUALITY.

The largest stock in our history means shipment from stock----That's SERVICE.

Get acquainted with us.

H. Mueller Mfg. Co., Limited

SARNIA :-: CANADA

1857 1918

When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER.

WORKS CONTEMPLATED

(Continued from page 27.)

theatre costing $30,000 will be erected by F. Litvack, 424 St. James St. N.

London, Ont.—Plans are being prepared for laying of 8-inch sanitary sewers costing $3,500 on Cheapside Street.

Picton, Ont.—Town Council contemplate installation of waterworks pump with 1,000 gallon per minute capacity.

Moose Jaw, Sask.—Moose Jaw Cold Storage Company will possibly erect an office building adjoining their plant in the spring.

Listowel, Ont.—J. M. Chinbein will rebuild business block on Main St. which was recently destroyed by fire at a loss of $25,000.

St. Hyacinthe, Que.—Hospital will be rebuilt for the Grey Nuns at a cost of $600,000. By-law has been passed granting $15,000.

Halifax, N.S.—The erection of a naval college is contemplated by the Department of Marine and Fisheries, Dominion Government.

Toronto.—The Board of Education may erect a new school to replace Rose Avenue building, which has been condemned as unsanitary.

Kamloops, B.C.—Military hospital will be established in the British Columbia interior. It is expected that Kamloops will be chosen for the site.

Nobleford, Alta.—Contract has been awarded to T. Eline, Victoria St., Red Deer, for the erection of a $12,000 bank building for the Merchants Bank.

Halifax, N.S.—Dalhousie University, damaged by the recent explosion, will be repaired at a cost of $20,000. The Carnegie Corporation will cover the expense.

Hamilton, Ont.—A factory, packing house, etc., may shortly be erected on Jarvis St. by the Swift-Canadian Company, Limited, Chicago, Ill.; local office, 4 Hamilton Ave., Hamilton.

London, Ont.—Tenders will be called for the erection of a $50,000 office building for the Huron and Erie Company, Richmond St. Architects, Watt & Blackwell, Bank of Toronto Building.

Kingston, Ont.—Board of Education has been informed by Inspector J. R. Stuart that Kingston's population having increased during the past two years an additional ten-room school must soon be provided.

Sedgwick, Alta.—The erection of a consolidated school is contemplated by Winnipeg School District No. 1924, Maxville School District No. 2599, Rosecliff School District No. 2840, and Fawn School District No. 3017.

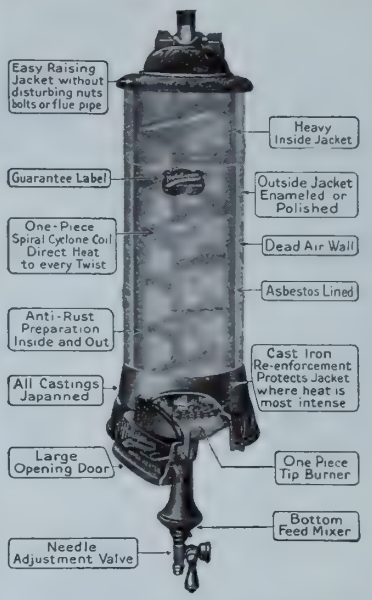
WORKS AUTHORIZED

Sarnia, Ont.—City will build immediately a sewage purifying plant.

Moose Jaw, Sask.—City will expend $1,700 on replacing six hundred feet of pipe line between the north and south basins of Snowdy Springs waterworks.

The Port Hope File Mfg. Co. of Port Hope, Ont., have issued a wall calendar featuring the P. H. and Imperial brands of files.

Service-Speed-Economy



The Hotstream WATER HEATER

BEST FOR BAD WATER

Quality Survives

Also Made With Cast Iron jacket.

The Hotstream Heater Co.
CLEVELAND, OHIO

W. H. CUNNINGHAM, 98 Kingswood Rd,. TORONTO
Canadian Representative



The best advertising you can get is to satisfy your customers and the most exacting customer will be thoroughly pleased with the quiet operation of the

TRADE SILENTFILL MARK

NO NOISE.
MANUFACTURED BY
CALLOW & PHILLIPS
40-42 Lombard St., Toronto, Can.
Telephone Main 2016

PERSONAL

D. J. Davidge has been appointed secretary of the Toronto Builders' Exchange to succeed George McSweeny. Mr. Davidge has been associated with the firm of Davidge & Lunn, general contractors, for the past three years.

George B. McSweeny, who has been associated with the Toronto Builders' Exchange for the past four years as secretary, has received a commission in the Royal Naval Air Service. Mr. Frank Saunders, on behalf of Mr. McSweeny's many friends in the exchange, presented him with a steamer trunk, a travelling bag and a purse of gold.

CONTRACTS AWARDED

Ford, Ont.—Purdy Mansell, Ltd., Toronto, have plumbing and heating contract in connection with the erection of a bank for the Canadian Bank of Commerce.

Galt, Ont.—Scott & Bennett, 12 Dickson St., Galt, have plumbing and heating contract in connection with erection of a $60,000 bank for the Merchants Bank.

FOR SALE

SECOND-HAND PIPE FOR SALE—115 FEET of 3-inch, 83 feet of 2-inch, 770 feet of 1¼-inch, 930 feet of 1-inch wrought iron pipe, also a quantity of fittings for same. This material is mostly 19 to 21 feet in length and is equal in every respect to new. Taylor's Garage, 1411 Yonge Street, Toronto.

MORRISON IMPROVED PRESSURE GAUGES



We manufacture a full line of Steam, Vacuum and Combination Gauges, Locomotives and Duplex Gauges.

Morrison's Standard Test Gauges; Hydraulic, Altitude and Sprinkler Alarm Gauges; Combination Water Works Gauges

Pyrometer Gauges; Engineers' Clocks and Revolution Counters; Pressure Gauge Testers; Pyrometers for Bakers' Ovens.

Recording Pressure and Temperature Gauges; Blast Pressure Gauges. Dealers in Thermometers for Heating Installations; Feed Water; Flue Gas, etc.

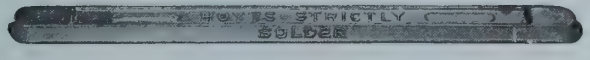
THE JAMES MORRISON BRASS MFG. CO., LIMITED

93-97 Adelaide Street West, TORONTO, ONTARIO



HOYT METAL GOODS ARE KNOWN

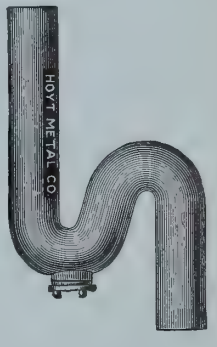
FROM COAST TO COAST



As time-savers there are none equal to our Wiping Solder Bar or Wire Solder.

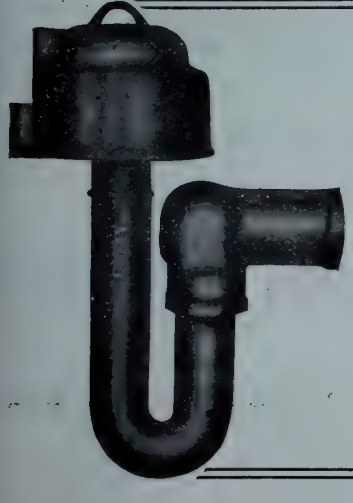
Hoyt Lead Traps, bends and waste pipe are in a class by themselves.

Our Mixed Metal Sales Amount To Over $5,000,000 Annually.



Write your Jobber **HOYT METAL COMPANY, TORONTO, ONTARIO** ***Write Us***

New York, N. Y., London, Eng., St. Louis, Mo.



A SYPHON WITHOUT A SINGLE FAULT

YOU CANNOT AFFORD TO TAKE CHANCES

You cannot afford to take chances with a syphon. It is the heart of a sanitary septic tank. Intermittent discharge is absolutely necessary, or the whole sewage system will be a failure. We unconditionally guarantee every syphon.

We manufacture a full line of cast iron pipe fittings at both our plants.

Ask your jobber for "Anthes" Syphons and accept no other.

ANTHES FOUNDRY, LIMITED

TORONTO and WINNIPEG

Spiers was licked!

WHEN Spiers, representing Cotton & Co., called on a certain Canadian retailer to solicit business, he was asked—"Why doesn't your firm advertise in DRY GOODS REVIEW, my business paper?" And Spiers replied, "My firm doesn't believe in trade newspaper advertising." Said the retailer—"Then I don't want to do business with your firm. Your firm may not believe in advertising, but I do, and I'm the man to be considered if you want my business."

The Retailer had a good deal to say to Spiers. Boiled down, it was:

"Your firm insults my intelligence. I pay $2 a year to have DRY GOODS REVIEW. It is the best newspaper, from a business point of view, that comes to me.

"I read the advertisements in it. They have a news value to me, and I am their debtor in many ways. Since war broke out, and goods have become scarce, I've sent mail-orders to a number of these firms. Travellers don't call on me as frequently as formerly. I suppose there are fewer of them, and I know its harder to get to me, since mine is a general store, off the main line. I want the advertisements of firms with goods to sell, and I want them published in DRY GOODS REVIEW. I don't want stuff sent me in an envelope through the mail.

"That's expensive for one thing; and it's a nuisance for another. I want a business firm's proposals to me in the newspaper I take home with me, and where I can always find it when I want to refer to it.

"When your firm says it doesn't believe in trade newspaper advertising, I have to regard it as a back-number firm in other ways. Probably it doesn't believe in adjusting complaints, or in giving me the sort of service I want and insist on having. I'm afraid of your firm, Spiers; and there are always other firms keener to do business with me than Cotton & Co. are. If you want to sell me, Spiers, link up with a house that gives me the information I want and in the way I want it."

Spiers is of that type of traveller who thinks that trade newspaper advertising is his competitor, not his assistant. He wants *all* the credit for orders secured. He thinks that he can command more money, in the way of salary, when his solicitations and successes are not contributed to in any way by trade newspaper advertising. He is somewhat like the manager who wants to do all the detail work himself, who is afraid to hire a good man for fear he will supersede him.

* * *

If this little story of Spiers and Cotton & Co. has any truth and point in it, it means that the following retailers' newspapers are worth considering as trade-influencers.

	Frequency.	Minimum Page Rate	Yearly cost Page every issue
DRY GOODS REVIEW	Monthly	$35	$ 420
MEN'S WEAR REVIEW	"	30	360
BOOKSELLER & STATIONER	"	25	300
SANITARY ENGINEER.....	Semi-monthly	16.70	400.80
CANADIAN GROCER	Weekly	24	1,248
HARDWARE & METAL.....	"	24	1,248

Breaking down the resistance of retail buyers by warm-hearted proposal-full communications addressed to them in page spaces in their business newspaper is cheap, when results are considered, at a yearly cost of $300-$1200. The amount to spend per annum depends (1) on the number and accessibility of your actual and potential customers; (2) on the number of your travellers; (3) on the frequency of their calls; (4) on the volume of your annual sales; and (5) on the nature and extent of your opposition (competitors).

If you will permit us to work out a definite proposal for submission on its merits framed in the light of the five factors noted above, please write us without fear that you compromise your fullest liberty of action and decision.

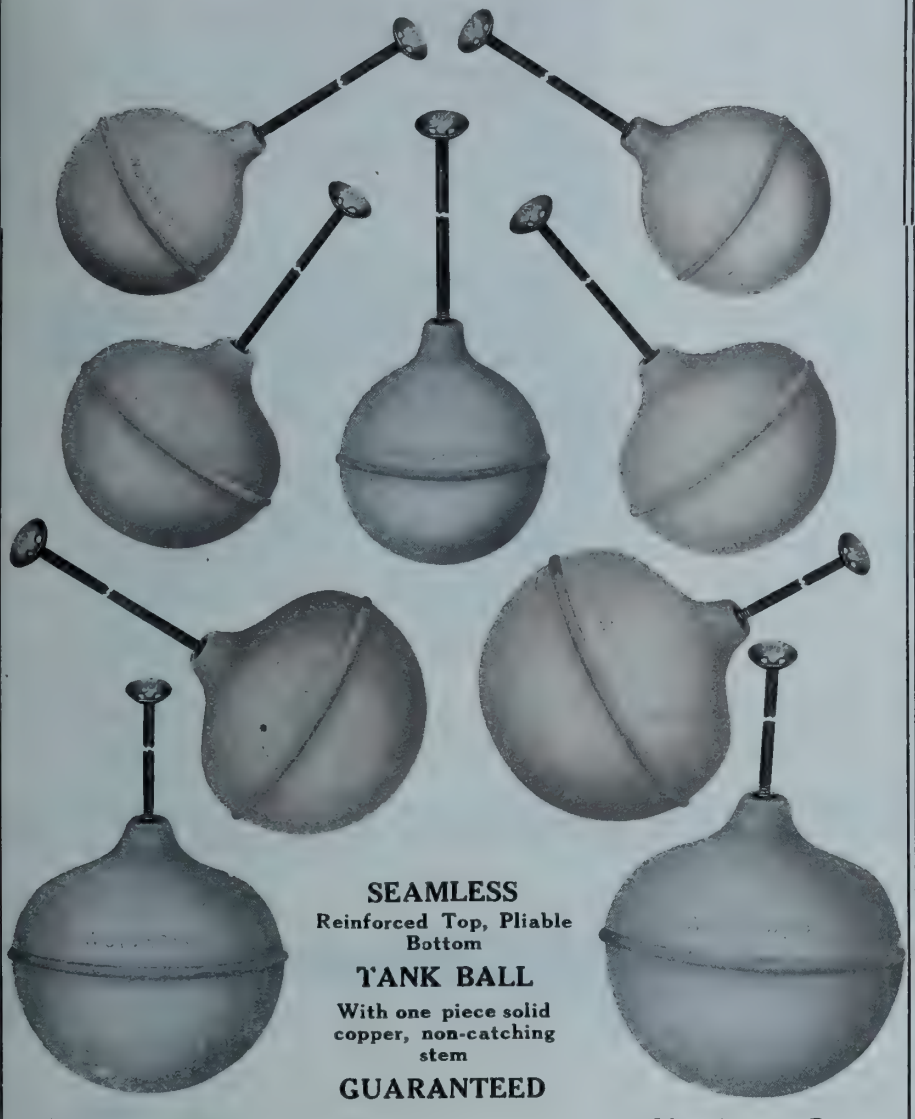
The MacLean Publishing Company, Limited

Toronto, Canada

Also at Montreal Winnipeg New York Chicago Boston and London, Eng.

"SURE SEAT"
Wolverine Tank Balls

BEST BY TEST



SEAMLESS
Reinforced Top, Pliable Bottom
TANK BALL
With one piece solid copper, non-catching stem
GUARANTEED

Canadian Wolverine Co., Ltd. - Chatham, Ont.

PURO
(MADE IN CANADA)

Every minute counts in getting maximum efficiency.

Our Puro Sanitary Drinking Fountains positively save 60% in drinking time, besides 35% of water ordinarily wasted. Can you afford to run your plant and lose and waste this money in old-fashioned drinking methods?

EFFICIENCY IS PATRIOTISM



Ask your efficiency expert to figure this out and you will find that:

500 men drink, say, twice a day. Under old conditions it takes between 3 and 5 minutes per man, twice a day. With PURO cutting the time in half, it would save from 1,500 to 2,500 minutes per day at an average wage of 20c per hour. The saving would be from $5.00 to $8.50 per day.

How long would it take to pay for installing our fountains?

NOW IS THE SEASON TO THINK OF YOUR WATER PROBLEMS.

ASK OUR EXPERT ADVICE.

Puro Sanitary Drinking Fountain Co.
147 University Ave., TORONTO, CAN.

WINNING THE BUYER'S FAVOR

THE best possible buyer is not made an actual buyer at a single step It is one thing to win the buyer's favor for an article and another to make adjustments incident to closing the sale. Winning the buyer's favor is the work of trade paper advertising. Under ordinary conditions it should not be expected to do more.

No Chilled Water to heat over

Note particularly the generous size of the King water post.

It is big enough to collect return water quickly, not leaving it in the pipes to cool. The water goes back to the boiler while still warm, which means less fuel to bring it back to the proper temperature.

The big water post is one of the reasons for rapid "King" circulation and low "King" coal bills.

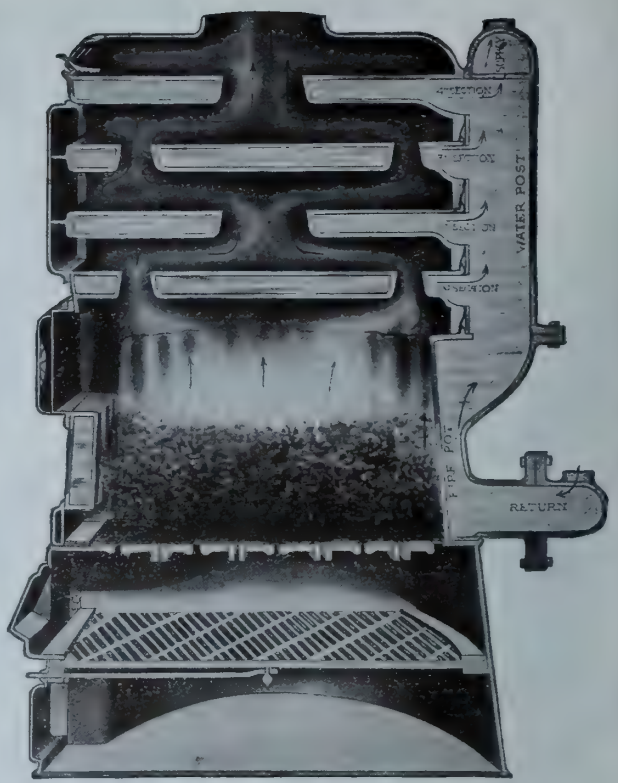
Prospective boiler purchasers will appreciate knowing of "King" economy. Tell them about it often. It's mighty good business just now.

STEEL and RADIATION, Limited

Head Office, FRASER AVENUE, TORONTO

304 University Street, MONTREAL 101 St. John Street, QUEBEC

AGENCIES IN ALL LEADING CITIES



Sectional View "KING" Boiler



JUST LOOK THERE–

The steam user just as well might dump coal into a sewer manhole as go to the trouble of firing up his boiler and then waste the steam by exhausting it in the draw. Don't waste. Use the COLE COAL SAVER — the Cole Return Trap.

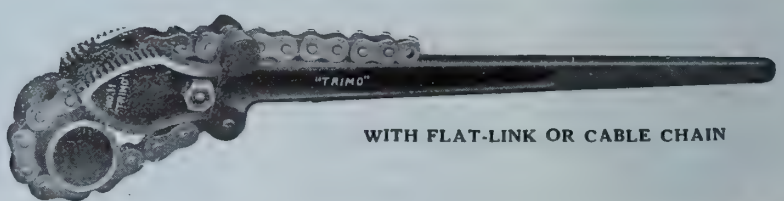
Look for this THE COLE FOR COAL ECONOMY Trade Mark

GEO. W. COLE, LIMITED

New Address: 2002 Dundas St. W.
Old Address: 838 Dundas St.
TORONTO

World-Famed Specimens of the Age of Steel

TRIMO



WITH FLAT-LINK OR CABLE CHAIN



TOOLS

Send for Catalog No. 91

MADE BY

TRIMONT MFG. CO., 55 Amory St., Roxbury, Mass., U.S.A.

Kindly Mention this Paper when Writing to Advertisers.

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You Can Repair a Cracked Boiler for $6!

WHAT does it mean to **you** to be able to do a **$100 repair job in 30 minutes?**

What do **you** figure it is worth to save welding and dismantling—save freight charges—save time—save the customer from being kept in the cold?

It's worth your while to know about **"X" Boiler Liquid.** Thousands of alert fitters are using "X" Liquid to increase their efficiency —AND TO MAKE MORE MONEY!

"X" is a pure liquid. It is poured into the boiler and instantly combines with the water. In sizzling out through the leak or crack the "X" is changed into a solid making a **permanent repair.** You don't have to know where the trouble is. "X" finds the leak or crack—and repairs it automatically.

"X" also prevents rust and scale. It remains in the water and keeps the inside of the boiler clean. "X" is not a cement or powder. It does not clog the air valves. "X" is absolutely GUARANTEED to do what you expect of it—or your money will be returned.

TRY "X"! You are SAFE in doing so, not alone because of our guarantee but because these famous concerns **use** and **recommend** "X" Boiler Liquid—

Pierce, Butler & Pierce, U.S. Radiator, Richardson & Boynton, Federal Radiator, National Radiator, Standard Sanitary Manufacturing Co., Crane Co., W. A. Case, Gurney Heater and thousands of live steamfitters.

IF YOUR JOBBER DOES NOT YET CARRY "X" LIQUID WE WILL SHIP DIRECT. WRITE US—NOW

"X" Laboratories
636 Washington Street, Boston, Mass., U.S.A.

"X" The wonderful BOILER LIQUID

Classified Buyers Guide

Occasionally advertisements are inserted in the paper after this page has gone to press. The insertion of the Advertiser's name on this page is not part of the advertising order, but is inserted solely for the convenience of the reader of the paper

Air Line Systems.
C. A. Dunham Co., Ltd., Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Air Valves.
Beaton & Cadwell Mfg. Co., New Britain, Conn.,
Beaton & Corbin Mfg. Co., Southington, Conn.
Canadian Wolverine Co., Ltd., Chatham.
C. A. Dunham Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London, Ont.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.

Asbestos Goods.
James Morrison Brass Mfg. Co., Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Boilers, Steam or Hot Water.
Lord & Burnham Co., Ltd., Toronto.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.

Boiler Feed Regulators.
C. A. Dunham Co., Ltd., Toronto.
James Morrison Brass Mfg. Co., Toronto.

Brass Goods, Valves, etc.
Joseph Breeden & Co., Ltd., Birmingham, England.
Canadian Brass Co., Ltd., Galt, Ont.
Canadian Wolverine Co., Ltd., Chatham.
C. A. Dunham Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London, Ont.
Galt Brass Co., Limited, Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
Kerr Engine Co., Ltd., Walkerville.
H. Mueller Mfg. Co., Ltd, Sarnia, Ont.
Puro Sanitary Drinking Fountain Co., Toronto.
L. Wolff Manufacturing Co., Chicago.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Brass Pipe and Tube.
Canada Metal Co., Ltd., Toronto
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London, Ont.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Cellar Drainers.
Galt Brass Co., Limited, Galt.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

Chain Wrenches.
Trimont Mfg. Co., Roxbury, Mass.

Closets.
Canadian Brass Co., Ltd., Galt, Ont.
Canada Metal Co., Ltd., Toronto.
Cluff Mfg. Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., Ont.
Galt Brass Mfg. Co., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Standard Sanitary Mfg. Co., Ltd., Toronto.
L. Wolff Manufacturing Co., Chicago.

Country Residence Equipments.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Ontario Wind Engine & Pump Co., Ltd., Toronto.

Damper Regulators.
C. A. Dunham Co., Ltd., Toronto.

Drainage Fittings.
Canada Metal Co., Ltd., Toronto.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.

Drinking Fountains.
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London, Ont.
Puro Sanitary Drinking Fountain Co., Toronto.

Ejectors, Steam.
James Morrison Brass Mfg. Co., Ltd., Toronto.
Kerr Engine Co., Walkerville.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Enamelware.
Amherst Foundry Co., Ltd., Amherst, N.S.
Canada Metal Co., Ltd., Toronto.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Standard Sanitary Mfg. Co., Ltd., Toronto.
Port Hope Sanitary Mfg. Co., Ltd., Port Hope.
L. Wolff Manufacturing Co., Chicago.

Electric Pumping Machinery.
Empire Mfg. Co., Ltd., London, Ont.
Ontario Wind Engine & Pump Co., Ltd., Toronto.

Fittings.
Canada Metal Co., Ltd., Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Flushometers.
Canadian Brass Co., Ltd., Galt, Ont.
Canada Metal Co., Ltd., Toronto.
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London, Ont.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Standard Sanitary Mfg. Co., Ltd., Toronto.
L. Wolff Manufacturing Co., Chicago.

Floor and Ceiling Plates.
Beaton & Cadwell Mfg. Co., New Britain, Conn.,
Beaton & Corbin Mfg. Co., Southington, Conn.
Canada Metal Co., Ltd., Toronto.
Canadian Wolverine Co., Ltd., Chatham.
Galt Brass Co., Ltd., Galt.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
James Morrison Brass Mfg. Co., Ltd., Toronto.
Steel & Radiation, Ltd., Toronto.

Gasoline Engines.
Ontario Wind Engine & Pump Co., Ltd., Toronto.

Gas Water Heaters.
Galt Brass Co., Ltd., Galt.
Holstream Heater Co., Cleveland.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Pittsburg Water Heater Co., Toronto.

Generators.
James Morrison Brass Mfg. Co., Ltd., Toronto.

Heaters.
Lord & Burnham Co., Toronto.
Steel & Radiation, Ltd., Toronto.

Lead.
Canada Metal Co., Ltd., Toronto.
Galt Brass Co., Ltd., Galt.
Hoyt Metal Co., Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

Mixing Valves.
Canada Metal Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Port Hope Sanitary Mfg. Co., Ltd., Port Hope.

Monkey Wrenches.
Trimont Mfg. Co., Roxbury, Mass.

Packing.
Canadian Wolverine Co., Ltd., Chatham.

Packless Radiator Valves.
Kerr Engine Works, Walkerville.

Pipe and Radiator Hangers.
Beaton & Cadwell Mfg. Co., New Britain, Conn.,
Beaton & Corbin Mfg. Co., Southington, Conn.

Pipe, Black and Galvanized.
Canadian Tube & Iron Co., Ltd., Montreal.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.

Pipe Cleanser
Chamberlain Desolvo Co., Ltd., Toronto.
Canadian Wolverine Co., Ltd., Chatham.

Pipe Cutters.
Trimont Mfg. Co., Roxbury, Mass.

Pipe Joint Compounds.
Canadian Wolverine Co., Ltd., Chatham.
James Morrison Brass Mfg. Co., Ltd., Toronto.

Pipe, Soil, and Fittings.
Anthes Foundry Co., Toronto and Winnipeg.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Toronto Hardware Mfg. Co., Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.
Warden King, Ltd., Montreal.

Pipe Threading Tools and Machinery.
Borden Canadian Co., Toronto.
John Hall & Sons, Ltd., Brantford.
A. B. Jardine & Co., Hespeler.

Pipe Wrenches.
Borden Canadian Co., Toronto.
Trimont Mfg. Co., Roxbury, Mass.

Porcelain Ware.
Canada Metal Co., Ltd., Toronto.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
L. Wolff Manufacturing Co., Chicago.

Pumps.
C. A. Dunham Co., Ltd., Toronto.
Galt Brass Co., Ltd., Galt.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Ontario Wind Engine & Pump Co., Ltd., Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Radiators.
Lord & Burnham Co., Ltd., Toronto.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.

Radiator Foot Rests.
Beaton & Cadwell Mfg. Co., New Britain, Conn.

Radiator Traps (Steam).
C. A. Dunham Co., Ltd., Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Range Boilers
Toronto Hardware Mfg. Co., Toronto.

Reducing Pressure Valves.
C. A. Dunham Co., Ltd., Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Roof Flanges and Flashings.
Canada Metal Co., Toronto.
Simplex Manufacturing Co., Chicago.

Rubber Goods
Canadian Consolidated Rubber Co., Ltd., Montreal.

Septic Tank Valves and Syphons.
Anthes Foundry Co., Ltd., Toronto.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

Solder.
Canada Metal Co., Ltd., Toronto.
Hoyt Metal Co., Toronto.

Steam Specialties.
Dart Union Co., Ltd., Toronto.
C. A. Dunham Co., Ltd., Toronto.
Kerr Engine Co., Walkerville, Ont.
James Morrison Brass Mfg. Co., Ltd., Toronto.
Peacock Brothers, Montreal.
United Brass Founders and Engineers, Ltd., Cornbrook, Manchester, England.

Steam Traps.
Geo. W. Cole Co., Ltd., Toronto.
Canadian Morehead Co., Ltd., Woodstock.
C. A. Dunham Co., Ltd., Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Smoke Test Machines.
James Morrison Brass Mfg. Co., Ltd., Toronto.

Tanks, Steel and Wood.
Ontario Wind Engine & Pump Co., Ltd., Toronto.

Testing Plugs.
James Morrison Brass Mfg. Co., Ltd., Toronto.

Tools.
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Trimont Mfg. Co., Roxbury, Mass.
Williams, J. H., & Co., Brooklyn, N.Y.

Unions.
Canada Metal Co., Ltd., Toronto.
Dart Union Co., Ltd., Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Vapor Heating Systems.
C. A. Dunham Co., Ltd., Toronto.
Moline Heat, Moline, Ill.

Vent Caps
Anthes Foundry, Ltd., Toronto.
Toronto Hardware Mfg. Co., Toronto.

Vitro Tanks.
Cluff Mfg. Co., Ltd., Toronto.

Vacuum Systems of Heating.
C. A. Dunham Co., Ltd., Toronto.

Water Supply Systems.
Empire Mfg. Co., Ltd., London, Ont.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Ontario Wind Engine & Pump Co., Ltd., Toronto.
Warden King, Ltd., Montreal.

Monuments To Wolff Plumbing



Michigan Avenue, Chicago, from Seventh Street north to Washington Street.

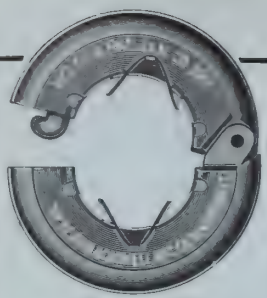
The following buildings on this world-famous Avenue are equipped throughout with Wolff Plumbing:

1. Blackstone Hotel
2. Congress Hotel
3. Congress Hotel Annex
4. Auditorium
5. Studebaker
6. Chicago Club
7. McCormick Building
8. Stratford Hotel
9. Railway Exchange
10. Orchestra Hall
11. Pullman Building
12. Theo. Asher Company
13. Edson Keith & Company
14. Gage Brothers & Company
15. Chicago Athletic Club
16. Tower Building
17. Ward Building
18. Chicago Public Library

L. WOLFF MANUFACTURING COMPANY

Manufacturers of Plumbing Goods Exclusively

General Offices: 601 W. Lake St. CHICAGO ***Showrooms:*** 111 N. Dearborn St.



OPEN VIEW
NO. 10-A.

The CEILING PLATE that's better



TOP VIEW
NO. 10-A.

THE NO. 10—A NARROW FLANGE PLATE IS A STEEL HINGED PLATE. FLANGES ¾" WIDE. HIGHLY FINISHED. ESPECIALLY DESIGNED FOR TWIN CONNECTION "NARROW."

The split ceiling plate is coming more and more into use than ever and ALWAYS GIVES A NICE FINISH, because it can be attached to mains and risers at the very last, and is not exposed during completion of a building on the floors.

High quality at the right price.



Gem No. 4.

Gem No. 4 Automatic Air Valve

Made from the best brass obtainable. Pressed shell and pressed brass base which eliminate danger from blowholes, which is a fault with cast bases.

Write for catalog showing our complete line of specialties.

The BEATON & CADWELL MANUFACTURING Co.

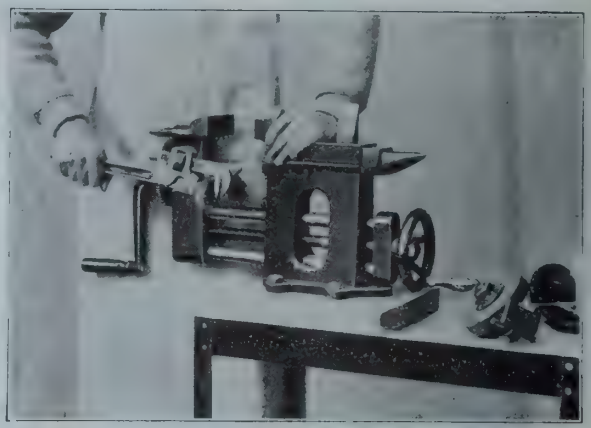
New Britain, Conn.

Eastern Agent: J. R. Devereux & Co., 233 St. James Street, Montreal. Western Agent: A. E. Hinds & Co., Chamber of Commerce, Winnipeg.

THE

Stewart Handy Worker

An Equipment All in One



WEIGHS 90 POUNDS

The Equipment Comprises——

A Pipe Vise
A Bench Vise
A Bench Grinder
A Two-Speed Drill
A Hardy Cutter
An Anvil

It's not a toy. It's a real combination of practical tools for practical people.

Write for full particulars.

CHICAGO FLEXIBLE SHAFT COMPANY

12th Street and Central Avenue
Department H.W. CHICAGO, U. S. A.

WROUGHT PIPE

BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES Black and Galvanized All Sizes

Ask your jobber for CT Brand

CANADIAN TUBE & IRON CO., LIMITED

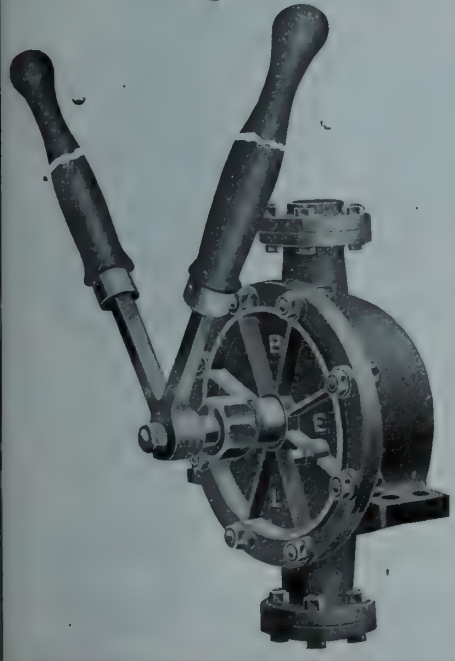
Montreal Works: Lachine, Can.

YOUR WANTS are many here below. Use the want ad. page and get rid of a few of them.









FIVE WORKS—OVER 3,000 EMPLOYEES

UNITED BRASS FOUNDERS and ENGINEERS, Limited

It is our intention after the War to devote our energies to the intensive production of the following Specialities:

Gunmetal and Brass Valves and Cocks.
Steam, Water and Compressed Air Fittings generally.
Cast Iron Stop and Sluice Valves.
Semi-Rotary Pumps.
Extruded Brass and Bronze Bars.
Brass Bolts and Nuts, Studs and General Turned Work from the Bar
Cast and Malleable Iron Cocks and Pipe Fittings.
Pressure and Vacuum Gauges.
Injectors, Engine Governors.
Spraying Machinery.
Coppersmiths' Work.
"Stella" Brand Alloys, Manganese Copper, Silicon Copper, Ferro Zinc, Phosphor Copper and Tin, etc.

Business After the War

If you are interested in any or all of the lines mentioned and are in a position to take a hand in the energetic distribution of the same, please communicate with us NOW to our Head Office.

EMPRESS FOUNDRY

Cornbrook, Manchester, England

MORE HEAT—LESS COAL

The present acute coal situation makes it the patriotic duty of every Heating Contractor to help conserve the country's fuel supply. Old, wasteful methods of heating must go. One pipe steam jobs are practically no longer recognized. The disadvantages of hot water are shown up more and more in the light of modern heating practice.



DUNHAM Radiator Trap

This device is one of the fundamentals of the DUNHAM HEATING SYSTEM. Because it makes impossible the presence of water in radiators, it prevents their pounding and knocking, reduces fuel consumption, causes the radiator to heat evenly and quickly, eliminates the hissing air valve and spurting water.

The One Safe Plan of Heating is---

The DUNHAM SYSTEM OF HEATING

By simple control at the radiator and the application of Dunham Radiator Traps, an even—mild—noiseless heating results.

Dunham Traps do away with all air valves, the bugbear of heating systems.

Air and water are quickly and quietly relieved by the large opening in the Dunham Trap. The result in coal economy is surprising.

Your scope of rendering Heating Service is limited if you are not acquainted with Dunham ways. May we send you bulletins and booklet on Dunham Heating for the home. It tells why.

C. A. DUNHAM COMPANY, LIMITED, Toronto, Canada

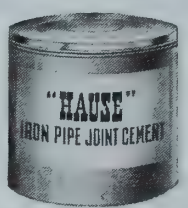
Branch Offices:

OTTAWA MONTREAL HALIFAX WINNIPEG GALGARY VANCOUVER

"HAUSE" PIPE JOINT CEMENT

For steam, water, air, oil, gas, gaskets, etc. The cement that cements. Sets like gum. Allows no leaks.

The Great Value of "HAUSE PIPE JOINT CEMENT" lies in its peculiar chemical properties which permits of its hardening and expanding after the joints are made up. In making up joints it has the same effect as a lubricant on the best graphite, and while the joints may be made and broken readily, a perfectly tight joint is maintained at all times. Comes in 1-lb., 5-lb., 15-lb., 25-lb., 50-lb. cans, 100-lb. barrels. Manufactured in ready mixed and powder form. Ask your jobber for prices, or write us direct.



Manufactured in Ready Mixed and Powder Form.

Made in Omaha, Neb., U.S.A., by

Chas. F. Hause Mfg. Co., Inc., Omaha, Neb.

THE BICALKY VENTILATOR

Is a real little wind engine. Will make ventilation positive.

No auxiliary heater required on local vents where a "Bicalky" is installed. Just take a good look at the illustration on page 6 of last issue and read the article which appears in the same issue on page 22.

Write us for full particulars.

BICALKY FAN CO.

BUFFALO, N.Y.

Canadian Sales Agents:

J. S. Chapman & Co., - 89 Jarvis St. Toronto

HAVE YOU USED THE "Simplex" ?

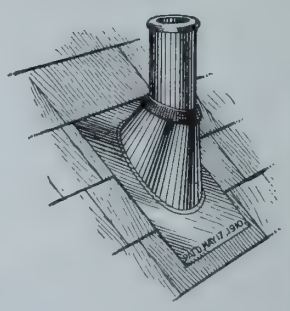
Prices to Trade

2-in. $1.00 4-in. $1.15 ea.

Made in all sizes from 1¼ to 6-in.

They fit any pitch from flat to 50°. Easy to apply. Made of heavy gauge galvanized iron, with pure lead collar soldered on, not merely pressed on.

Any jobber in Canada can supply the "Simplex." Give your favorite jobber an order.



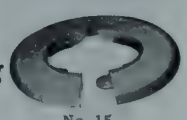
SIMPLEX SALES COMPANY

CHICAGO, ILL.

Canadian Representative; W. H. CUNNINGHAM, 98 Kingswood Road TORONTO, ONT.

"B&C" COMBINATION COLD ROLLED STEEL Floor and Ceiling PLATES

Carried by the leading supply houses



No. 15

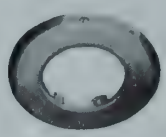
Puts just the right finish on that heating job

Send for catalog of complete line of "B. & C." goods.



No. 1 Valve

Stock carried by our Canadian Representative W. H. CUNNINGHAM, 97 Kingswood Road, Toronto, Ont.



No. 16

The Beaton & Corbin Mfg., Co. Southington, Conn., U.S.A. The Old Original Company



No. 17

There can be no rust or corrosion in a Dart Union because the face and seat are of bronze.



Dart Unions save time as well as trouble



There is a saving of time as well as an assurance of permanence in using Dart Unions. Pipe lines can be easily and quickly connected, whether in or out of alignment. The ball-shaped joint permits a connection to be made so long as the nut can be started on its thread.

Save time and have a better job by always using Dart Unions.

All jobbers sell them.

Manufactured by

DART UNION CO., Limited

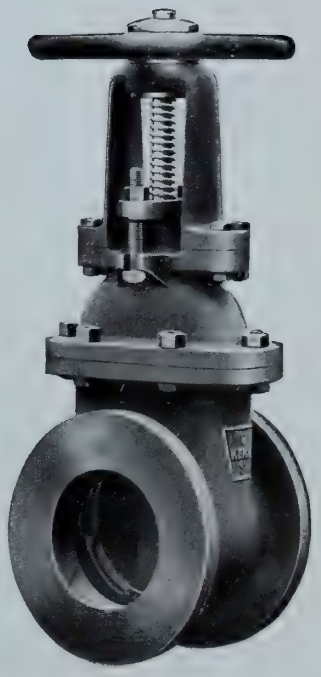
TORONTO, CANADA

There Are Lots of Gate Valves



advertised and sold, but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.

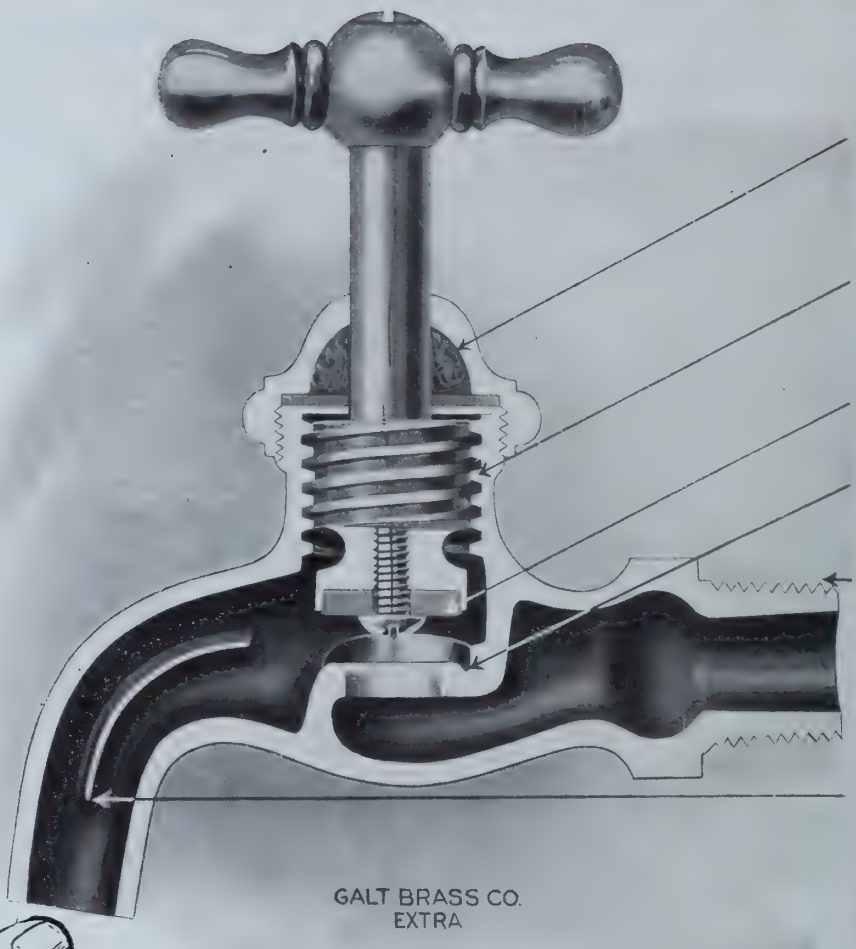
Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.

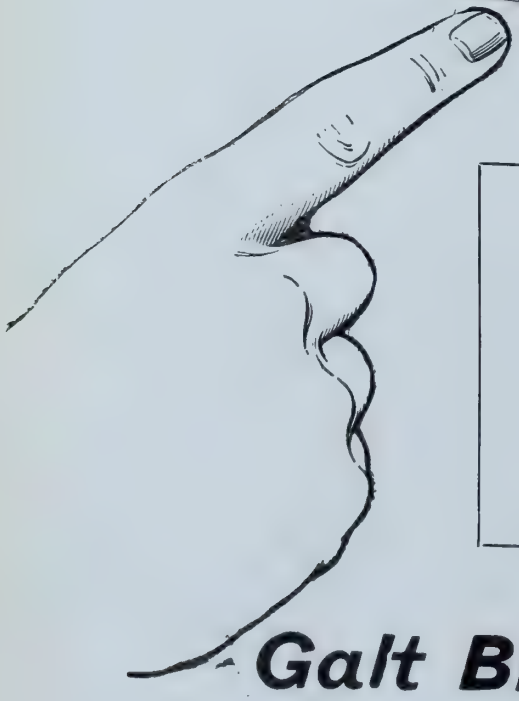
Approved by the Fire Underwriters Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario

Registered **PERFECTO** *Trade Mark*

You Can Install This Line and Establish Confidence of Your Customers





GUARANTEE

Any article of our make proving defective through inferior metal, or improper workmanship, on our part, will be replaced with TWO good ones, at NO CHARGE to you.

CAN YOU BEAT IT?

SEND US YOUR ORDER NOW

Galt Brass Company, Limited

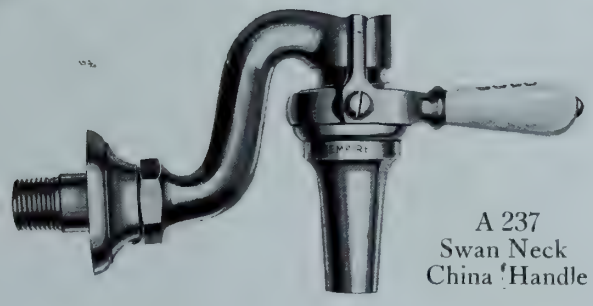
Galt, Canada

SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

Vol. XII. Publication Office, Toronto, February 15, 1918 No. 4

For Kitchen Slop Sink and Laundry Tray



A 237
Swan Neck
China Handle

To provide long service without trouble, to give quick and easy action, to remove all splashing, spreading and spattering there is no faucet equal to the "Kitchener" Packless Quick Opening Bibb.

"Kitchener" Bibbs are made of full-quality red metal, are nicely finished, and will outwear any faucet of like kind.

The installation of "Empire" Products is the one sure way of quickly gaining a reputation for quality work. Every job that you put in with "Empire" goods means the adding of friends to your business list.

Extend your connection and at the same time get your due profit by installing "Empire" Goods.

Empire Manufacturing Company, Limited

London :-: Toronto

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While



A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for BEAVER BRAND CAST IRON ENAMEL WARE

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

ONTARIO:
Monarch Brass Mfg. Co., 71 Brown St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes, 120 Lombard St., Winnipeg

Dominion Rubber System Pension Fund

Details of Pension Plan adopted by Canadian Consolidated Rubber Co. Limited, for its employees.

1. NAME The name of the plan is Canadian Consolidated Rubber Co. Limited Pension Plan.

2. OBJECT After careful consideration of the subject and an examination of existing pension systems, the Company has adopted the following plan as the most liberal for employees who, by long and faithful service, have earned an honourable retirement.

3. DEFINITIONS a. In these regulations the word "Company" shall mean the Canadian Consolidated Rubber Co. Limited, or its successors.

b. "President" and "Board of Directors" shall mean the President and Board of Directors of the Company.

c. The word "Committee" shall mean the persons appointed by the Board of Directors to administer the Pension Plan in accordance with approved regulations.

d. The word "employees" shall mean those persons who receive a regular and stated compensation from the Company, other than a pension or a retainer.

e. The expression "term of employment" shall mean period of continuous employment in the service of the Company, or any company or companies subsidiary thereto, allied with, or predecessors of the Company, and shall include such employment whether commenced prior to the adoption of this plan or not.

f. The expression "continuous employment" shall mean service with the Company continuously without a break of any kind, except as due to leave of absence, sickness, injury, or necessary temporary lay-off on account of reduction of force or for any other reason, all such cases to be subject to the discretion of the Company; but when such absence exceeds six months in any twelve consecutive months it shall be deducted in computing the length of service. In any other case than such mentioned, if a person is re-employed after such a break in the continuity of this service, for the purposes of this pension plan he shall be considered as a new employee.

4. PENSION COMMITTEE a. There shall be a committee of not less than five nor more than seven, appointed by the Board of Directors to serve during its pleasure, whch shall be called the Pension Committee. This Committee shall be charged with the administration of this plan.

b. The Committee shall have the specific powers elsewhere herein granted to it, or that may be granted to it from time to time by the Board of Directors. Exceptions to or deviations from the regulations so laid down shall in all cases be subject to the approval of the Executive Committee of the Board of Directors of the Company.

c. It shall determine conclusively for all parties all questions arising in the administration of this plan.

d. It shall adopt such by-laws and rules of procedure as it may find necessary, subject to the approval of the Board of Directors.

e. It shall be empowered to employ a secretary and such other assistants as may be required in the administration of the plan.

5. PENSION FUND The Company shall appropriate such sums of money from time to time as may be necessary in administering this plan, and no contributions will be required, or received from any employees of the Company.

6. ELIGIBILITY a. All employees of the Company engaged in any capacity whatsoever, and wherever located, are eligible to a pension as hereinafter stated.

b. All male employees who have reached the age of sixty-five years and whose term of employment has been twenty years or more, and all female employees who have reached the age of sixty and whose term of employment has been twenty years or more, may with the approval of the Pension Committee retire from active service, if they so desire and become eligible for pensions.

c. All male employees who have reached the age of sixty years and whose term of employment has been twenty years or more, and all female employees who have reached the age of fifty-five and whose term of employment has been twenty years or more, may at the discretion of the Pension Committee be retired from active service, and become eligible for pensions.

7. DISABILITY PENSIONS At the discretion of the Committee and with the approval of the Board of Directors, any employee who has become totally disabled as a result of sickness or injury, compensation for which may not otherwise have been provided, and whose term of employment has been fifteen years or more, may be retired from active service and granted a pension. If a pension is granted it shall be for such period as the Committee may determine, and if at any time during such period the employee recovers sufficiently to resume active service, the pension may be discontinued by action of the Committee. If the employee re-enters the service of the Company at the time such pension is discontinued he shall be eligible to a pension under these regulations, and the period of absence on disability pension shall be considered as a leave of absence and not a break in the continuity of the employee's service.

8. AMOUNT OF PENSIONS a. The annual amount of such pensions shall equal one per cent. of the average yearly wage for the ten years prior to retirement, multiplied by the number of years employed, but such pensions shall not be more than $5,000.00 per year, nor less than $240.00 per year.

For example, if an employee's average annual wage for ten years is $1,000.00 and he has been in the service for thirty years, he would receive 1% of $1,000.00 or $10.00 multiplied by thirty, or $300.00 per year or $25.00 per month.

b. In case of special difficulty in determining with practical accuracy the average yearly wage for the ten years prior to retirement, the Committee may at its discretion take some smaller consecutive number of years for the purpose of determining a fair average yearly wage.

9. PAYMENT Pensions shall be paid to the pensioner personally on the first of each month from the date of retirement until the death of the employee, unless suspended for such reasons as are described in this plan, and in case a male pensioned employee at the time of death is survived by a widow, or if either male or female pensioned employee is survived by minor children, the pensions shall be continued for three months after death, payable to the widow in the first instance and to the administrator or other legal representative of the minor children in the second case, to be applied as in the case of other property of the deceased, in the interest of the minor children.

10. GENERAL PROVISIONS a. Neither the action of the Board of Directors in establishing this Pension Plan or any action hereafter taken by the Board of Directors or the Pension Committee shall be construed as giving any officer or employee or agent of the Company the right of service, or any right to a pension; and the Company expressly reserves its right and privilege to discharge at any time any officer, employee or agent when the interests of the Company, in its judgment, may so require, without liability for any claim for a pension or other allowance other than salary or wages due and unpaid.

b. The Board of Directors may annul, alter, add to or amend in any way any and all of the provisions contained in this plan, or hereafter adopted by the Board of Directors in respect of this plan, and may at any time set aside any action taken by the Pension Committee.

c. The Company guarantees that, once a pension has accrued to a particular employee, it will continue such pension for the life of the particular employee and as specified with reference to widows and minor children; subject, however, to the provisions and conditions of the regulations laid down by the Board of Directors or the Pension Committee. It is understood that Section 10b given above shall not affect such guaranty.

d. Assignment of pensions under this plan will not be permitted or recognized.

e. Pensions may be suspended or terminated in the discretion of the Committee in cases of gross misconduct or of any conduct prejudicial to the interests of the Company.

f. Any retired employee may, by first obtaining the approval of the Committee, engage in any occupation or work which is not prejudicial to the interests of the Company. If any retired employee shall engage in any thing which in the judgment of the Committee is prejudicial to the interests of the Company, the payment of a pension to such retired employee may be suspended or discontinued.

g. Regular employment with this Company shall suspend the right of a retired employee to pension payment during the period he continues in such employment.

h. In case any pension shall be payable under the laws now in force, or hereafter enacted, of the Dominion of Canada or any Province thereof or any State or Country, to any employee of the Company under such laws, the excess only, if any, of the amount prescribed in this plan above the amount of such pension prescribed by law, shall be the pension payable under this plan.

11. TIME TO TAKE EFFECT This plan shall take effect January 1st, 1918.

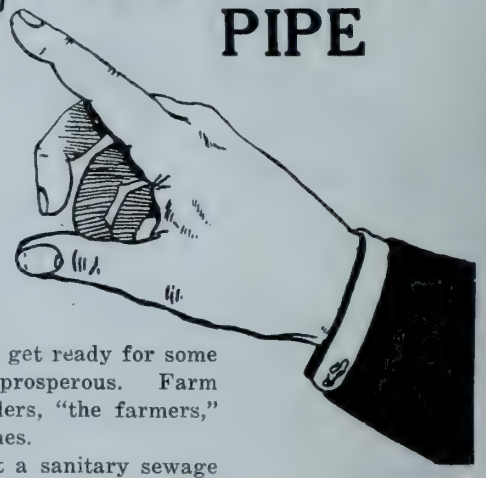
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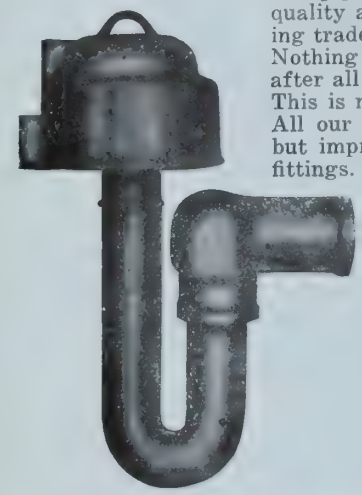
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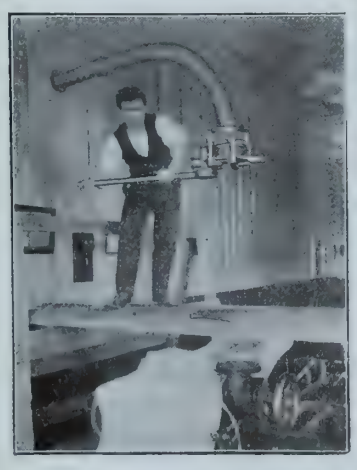
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MACLEAN'S MAGAZINE for FEBRUARY

John Bayne Maclean Robert W. Service
Agnes C. Laut George Bernard Shaw
Archie P. McKishnie Alan Sullivan, *et al.*

The Ending of the War—When? How?

JOHN BAYNE MACLEAN writes with amazing courage and information about the war situation, past and present, in the February issue of MACLEAN'S MAGAZINE. He tells of the bungling of politicians in Britain and elsewhere—men of Cabinet rank who baulked the military and naval leaders, and in his exposures he includes some military and naval men. What Colonel Maclean writes rubs some men the wrong way—those who have "ostrich minds." But the whole English-speaking world is Colonel Maclean's debtor for publicly stripping away the concealments of truth, and letting the world see things as they actually are. Colonel Maclean's contribution is entitled **"Why We Are Losing The War."**

The Eternal Irish Question

this time dealt with by that surprising, bold-thinking, unharnessed man, *George Bernard Shaw.* Mr. Shaw puts the Irish Question forward in a fresh way, and proposes a novel—yet not impracticable—solution. Writing in trenchant style, and always sensibly, Mr. Shaw is worth reading. MACLEAN'S MAGAZINE shares with a London (England) daily paper the right to publish this article by Mr. Shaw. In passing, we desire to suggest to you that the class and quality of articles and contributors which MACLEAN'S MAGAZINE is securing are matters for all Canada to have pride in.

It scarcely needs to be said that such a wealth of good reading matter, much of it of first-class current interest, makes MACLEAN'S MAGAZINE take its place fairly alongside the best magazines in the world.

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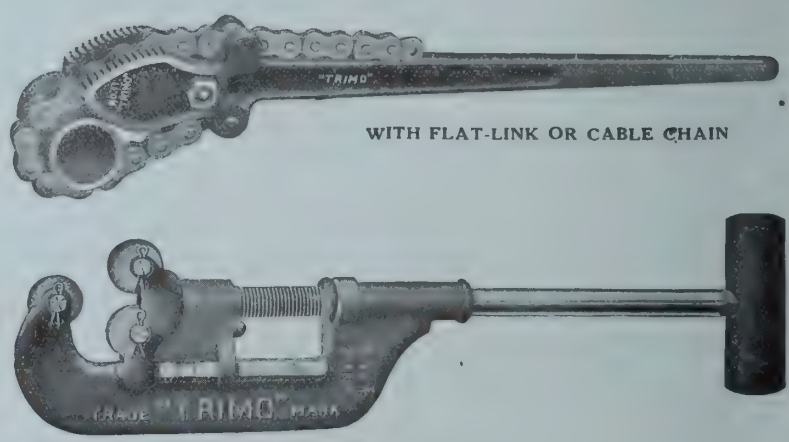
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SANITARY ENGINEER
PLUMBER AND STEAMFITTER OF CANADA

Vol. XII. TORONTO, FEBRUARY 15, 1918 No. 4

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EDITORIALS

Encouraging at Least—A Heating By-Law

The MacLean Publishing Co., Limited

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SANITARY ENGINEER

VOL. XII FEBRUARY 15, 1918 No. 5

A Simple Price List for the Trade

No Guesswork if a Proper Price and Cost System is Adopted — Many Price Lists Drive Trade Away—This Story Tells of a System Fair to All.

IT may sound foolish to talk about a price-list that drives away business, but for all that there are quite a umber of them that do, so I am going o tell you about a certain plumber's ac-ountant and manager who accidentally tumbled on the fact that his price-list vas doing that very thing. Then I am oing to tell you how he has been able o adopt a plan that not only enables im to procure more jobs, but in-identally puts him in a position where e gets considerable business away from ompetitors who have not yet seen the ght.

The story starts with a trip this man ade some three or four years ago. He vas out calling on the trade, making a ew calls among plumbers, with the hought tucked away back in his head hat by getting the other fellow's point f view he could so shape his selling ethods that a larger share of the busi-ess might come to him and help the ther fellow, too.

On this particular day he was calling n a rough-and-ready customer. He ound his man seated in front of a stack f papers, and in no mood for conversa-ion. It transpired that this plumber vas working on a contract for a good-ized school, and the cause of his per-urbation was an innocent-looking price-ist. He was in the middle of an esti-nate on a contract he was bidding on, nd, try as he would, he simply could ot find out what the prices in the price-ist were; what he had to charge. No loubt an expert accountant could tell by a few minutes' figuring what the prices eally were, but accountancy is far re-noved from plumbing, and while a man nay be a good plumber, it does not al-vays follow he is a natural-born ac-ountant.

Evidently this particular plumber was among those not gifted in a mathemati-al direction. He had not studied alge-ra, geometry and trigonometry, because he more he figured the further away he ot from the price. By the time the ause of it all had got comfortably seat-ed, he was all cleared for action and ready to take on all comers, especially those who had to do with the system of discounts. And he told his visitor, the accountant, in the soft, kindly way that only plumbers have (?) just exactly what he thought of his price-list and his way of making a poor, hardworking plumber stay awake nights figuring dis-counts.

Difficulties in the Way

By accident our friend the accountant had stumbled upon a big opportunity. "Why can't I work out some method of giving every plumber the actual cost on the materials they buy, and do away with all this figuring?" he thought. Of course, it would be necessary to use some sort of a standard discount, as it would never do to let the poor consumer know what the plumber had to pay for his supplies, but he decided to think it over. He spent a lot of time on the idea to try earnestly to work it out.

So for three years he thought over the idea, each month seeing some difficulty unsolved; working out some way to give the trade a standard price so that it could quickly figure the net costs. Finally, some time ago a small company was formed and announced in its trade paper advertising its new cost-figuring system for plumbers, and explained that full details of this new method of figuring costs would be explained upon request.

This initial announcement brought a flood of inquiries, as might be expected. It opened up new worlds to the plumber, whose main worry in life was getting out an estimate. With this system—whatever it was—he could get more time with his family, he could spend time he formerly spent in working over estimate sheets getting a line on new business—in short, it took a lot of drudgery out of his work. Because it would do all these things, he was immediately enthusiastic over the plan, and would have been willing to pay almost any price within reason for the system of accounting. No doubt he figured it would be a simple matter to tack the difference onto his customers' bills anyway. Anyhow, pretty nearly every plumber who knew of the firm and who read the trade paper ad wrote for the system. And here is what they found out.

All Standard Equipment on Even Basis

The company pointed out that it had spent an immense amount of time in working out a simplified system of figuring costs. Even after putting in all this time, it was found impractical to issue a bound price-list, so the company had arranged to furnish such plumbers as would be willing to stand their share of the cost with an attractive, husky, loose-leaf binder. Then it would send to each plumber having this binder frequent sheets showing the prices of all standard equipment, worked out to actual cost, plus a working percentage. Of course, it would mean mailing them sheets every few days, and postage stamps cost money—but for all that they would be glad to let them in on this new method of estimating if they wanted to take advantage of the offer. All it would cost them would be 10 cents a day every working day, and surely that amount could not break anyone.

Plumbers who were approached hastened to get a binder and pay their $36 a year to get the price-list sheets sent to them regularly. Before long several hundred plumbers were on the subscription list, and using guaranteed prices instead of hunting through several different discount sheets, and then getting the prices wrong. This new system, while still having many problems before it, bids fair to become one of the biggest things ever accomplished in the interest of the plumbing and heating trade in Canada. The writer has interviewed quite a number who have adopted it, and everyone without a single exception declares that they cannot understand how they ever got along without it, and, as one member said, "All for the price of one good cigar a day."

Data on Siphonic Action

Explaining the Principles Governing Siphons—How They Work and Why—Atmospheric Pressure Plays Important Part in Siphonic Action.

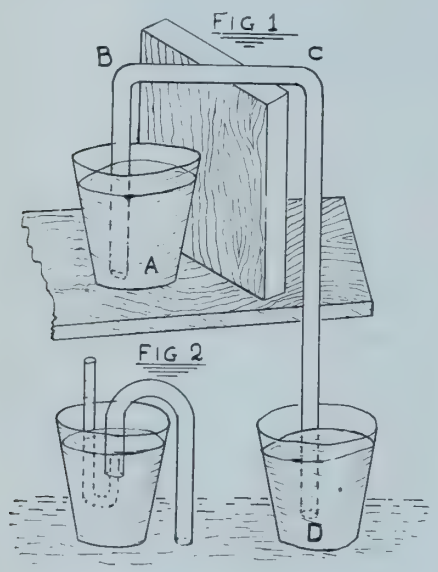
By R. O. Wynne-Roberts, Consulting Engineer, Toronto.

THE study of the action of siphons is both interesting and instructive. Siphons are often used, but are not always understood, consequently the results anticipated are not always realized.

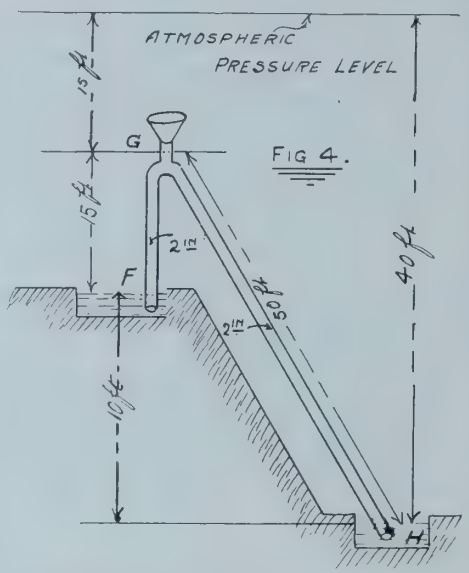
The first step to grasp the problem and its solution is to discuss a simple experiment. The small glass tube in Fig.1, is filled with water, and the ends are closed by stoppers. The top vessel is full of water and the bottom one is empty.

Place the glass tube full of water in position as shown in Fig. 1, remove the stoppers and the water will flow from the top vessel to the bottom one. This siphonic action will continue until air enters the upper end of the tube, and then it will cease. Suppose another smaller tube with a hooked end, is dipped into the top vessel, Fig. 2, and pushed into the siphon. In this case the siphonic action will be broken, although there is water to draw.

The explanation is a simple one. The atmospheric pressure on the water in both the vessels is the same. The atmosphere is at least 45 miles above the



earth. At sea level its pressure is 14.7 lbs. per sq. inch but at an elevation of 1000 feet above sea level it is reduced to 14.2 lbs. So that for small differences in level there is practically no change in pressure. The air pressure tends to force the water from A to B and from D to C. The water column A-B in the tube acts downward against the atmospheric pressure, and likewise the water column C-D opposes the same atmospheric pressure. The atmospheric pressure being the same on the water surface in both vessels, it can be ignored. The



position then is the weight of A-B as compared with that of C-D; the latter being greater, it acts like an ordinary beam weighing machine, the greater weight on one side draws up the lighter one on the other side. The water, in this manner, is set in motion, and it continues to flow until the top vessel is emptied or air is drawn in. The siphon must be free of air to enable it to work. If, as in Fig. 2, air is admitted into the glass tube, then the atmospheric pressure is the same inside as on the water surface and no siphonic action takes place. Under ordinary conditions, water is neither compressible nor expansible, but air is so to a remarkable degree. For example if a pressure equal to 34 feet is reduced to about 3½ feet, water will not be changed in volume, but air will be expanded ten times.

What can be done on a small scale cannot always be done in a large way, for the reason that the pipe cannot be filled with water and put into operation so easily. Fig. 3 illustrates a siphon designed to draw water from one tank and discharge it into another at a lower level. The pipe is say 2 inches in diameter and 50 feet long over all. The difference in level between the water surface in the tanks is, say, 10 feet. The left leg F-G is, say, 15 feet. Such a pipe would be too cumbersome to fill with water and put in place like the small glass tube. Before this siphon will act all the air must be exhausted. This can be done by closing the two valves on the short and long legs and pouring water slowly into the funnel at G (or if the scheme is a larger one then fix an air pump at G); the valves must be closed until the air has been driven out. When the siphon is required to operate simply open the valves.

When the air has been completely exhausted, the atmospheric pressure has been removed, that is, perfect vacuum has been created, but the atmospheric pressure remains on the water surface in the tanks, consequently the water is forced into the pipe under a head equal to 34 feet. The water then has filled the pipe, and as the leg G-H is longer than the leg G-F, and therefore the first water column is heavier than the other, the water will move downwards when the valves are open. The water in the top tank will be siphoned out into the lower one, unless, or until air gets into the pipe, when the siphonic action is disturbed and water ceases to flow.

There are limits to the use of siphons. The atmospheric pressure at sea level is about 14.7 lbs. per sq. inch which is equal to a column of water 34 feet high. As the elevation of the land rises above the sea level, the atmospheric pressure reduces as per table:

Height of land above sea level.	Atmospheric lbs.	Pressure in inches mercury	Feet of water
At sea level	14.7	30.00	34.00
500 feet above sea level	14.5	29.47	33.3
1,000 feet above sea level	14.2	28.94	32.8
2,000 feet above sea level	13.7	27.92	31.6
4,000 feet above sea level	12.7	25.98	29.4

The vapour tension of water reduces the capacity of siphons so an allowance must be made for the same when any important problem has to be solved:

32°	Fah.	vapor tension	=	0.21 feet
40°	"	"	=	0.28 "
60°	"	"	=	0.60 "
80°	"	"	=	1.15 "
100°	"	"	=	2.19 "

Suppose a small quantity of a volatile liquid was forced into the siphon with the water, it would evaporate and the pressure of the vapour would tend to cause the water in the pipe to fall, or in other words it would counteract the force of the atmospheric. As the temperature of the water rises the vapour increases as shown in the table.

Since the force that drives water into what is called the suction pipe of a siphon or a pump, is equal to 34 feet, it is evident that the lift cannot exceed this figure. Moreover, as the elevation

of the land increases, the lift diminishes, until at 4000 feet above sea level, it cannot be more than about 29.4 feet .The vapour tension reduces the lift; it is difficult to maintain perfect vacuum in the pipes, because air leaks in; and other conditions make it impossible in practice to get what is theoretically true. So at sea level it is safe to assume that the siphonic lift cannot exceed 25 to 30 feet, and at high elevation it will be less.

It should be borne in mind that as the lift from F to G is increased and the leg G-H remains constant the delivering capacity of the siphon is reduced. When the lift is about 25 feet and unless the joints are perfectly air-tight siphonic action will about cease. The discharging capacity of any siphon depends upon the difference in level between F and H, provided that the leg F-G does not exceed, say, 25 feet. There are, nevertheless, many things which tend to reduce the velocity and therefore the discharge. The entrance of water into the siphon is not full, unless the mouth is properly curved like a trumpet. The friction between the water and the interned pipe surface increased rapidly as the velocity increases. The actual discharge is, therefore, less than the theoretical.

There is at Richmond, Ind., a siphon 16 inches in diameter and three miles in length, which draws water from a large well located in a watershed. The short leg is about one mile long and the difference in level between the crown of the siphon and the water in the well is about four feet. As air accumulated in the higher part of the siphon and interfered with the discharging capacity of the main, it was decided to instal a horizontal cylinder 12 ft. long by 40 inches in diameter, which contained a float connected to an external switch. The siphon and cylinder were filled with water, as explained at the commencement of this article, and all air was driven out. But as air leaks into the main, it is collected in the cylinder, allowing the water therein to fall. When the water level has fallen to a certain level the float automatically operates the outside switch and the air is exhausted by means of a small pump driven by a two-horse power electric motor. When the water again rises sufficiently it causes a valve to close and the pump to stop.

At East London, South Africa, there is a 12-inch siphon for drawing water from a reservoir over the embankment at the rate of about 360.000 gallons per day.

TO LICENSE PLUMBERS

That the town council of Steelton, Ont., appoint a board of examiners for plumbers and have plumbing tradesmen under license, was the recent request of a delegation from the Plumbers' Association. The delegation also asked for the appointment of a plumbing inspector for the town, adding that as long as there was no competent inspector the council should not interfere with the work of the plumbers.

THE FAHRENHEIT THERMOMETER

It is a peculiar phenomenon in history that the different nations have measured temperature by thermometers invented by men not of their own nationality, and the explanation of this also throws light on the mental make-up of the respective peoples. The English, most conservative of all, cling to the first method of measurement and still measure temperature by the thermometer as first used by its inventor, a German professor of physics at Konigsberg.

Fahrenheit placed zero at the temperature of the very coldest day he had experienced in his own city of Konigsberg, and this zero is still the zero for every English mind. The degrees in which he measured were accidental, and the freezing point fell on the degree 32. His invention was practical, and so the English Government introduced it into the navy for official measurement of temperature.

This settled the question, and no change has occurred down to the present day, for if the English mind accepts one method of action it will stick to it until the end of time. The English have clung to the Fahrenheit scale, although there are some very obvious criticisms to be made concerning it. The zero point is purely accidental, and the temperature-points which are of special importance in the field of natural phenomena fall on integral degrees, these points being distributed over the scale in the haphazard fashion characteristic of the Fahrenheit system.

The two temperature-points of greatest significance for life on this earth are certainly the freezing-point of water and the point at which water boils under normal conditions. It was a Frenchman, Réaumur by name, who had the practical sense to adopt as his basal temperatures the freezing-point and the boiling-point of water. Réaumur called the freezing-point zero and fixed the boiling-point at 80 degrees. As soon as his obviously well-designed reform was made, Germany adopted his system and it was soon in general use in that country.

But there is one point in Réaumur's system which is not practical. He divided the most important portion of his thermometer-scale into 80 degrees, while at present the decimal system is used in all forms of measurement. For example, the French divided their coins—the unit being the franc—into centimes or hundredth parts of the franc, and in like manner the Americans divided the dollar into cents. In 1871 the Germans followed suit by establishing the mark as a unit and dividing it into one hundred pfennigs, and the Austrians likewise divided their monetary unit, the crown, into one hundred hellers.

About 1742 a Dane by the name of Celsius proposed that Réaumur's 80 degrees be replaced by 100 degrees, and the French, who are always prone to accept the most recent method and do not hesitate to change old systems, accepted it at once, and so for a long time the English in their more conservative habit followed the earlier German system, the Fahrenheit; the Germans followed the French method; and the French followed the Danish method, the most recent innovation.

There is no doubt that to Fahrenheit belongs the honor of having invented the thermometer; all the essentials of temperature measurement were invented by him, and we shall never forget that he was the pioneer in this field. The later changes are insignificant as far as the essential characteristics of the invention are concerned, though they are undoubtedly improvements, and it is strange that Fahrenheit himself did not anticipate them. If his attention had been called to them he would no doubt have accepted them at once. But he was a professor and a learned man who was out of touch with practical life. His invention was before the general introduction of the decimal system in other fields of measurement, and for scientific purposes it is quite indifferent where the zero is placed. But we must recognize that the improvements introduced by Réaumur and Celsius make the thermometer much simpler and ought to be introduced without quibbling.

We Americans, being very strongly under the influence of English traditions, follow the English Fahrenheit fashion, and it has remained our system to the present day. That America has so long followed the English conservatism is only a sign of our lack of independence. In scientific circles the centigrade system has been in general use for quite a long while. It is time that the United States took the step now being advocated by Mr. Albert Johnson, who is fathering a bill in Congress having for its object the replacement of the Fahrenheit scale of temperature in United States government publications by the centigrade scale. There is not the slightest doubt that it will ultimately be accepted. If it is not adopted now, it will be in the near future, and the rising generation will feel ashamed that we have been so slow in advancing along the path of unequivocal progress.—Dr. Paul Carus, in the *Open Court*.

APPROPRIATION FOR GUELPH SEWAGE SYSTEM

The Sewerage and Public Works Commission of Guelph, Ont., at its regular meeting recently received the following report of City Engineer McArthur on the work of the Commission during the past year. The sum of $14,500 was appropriated by the city council for the current expenditure under the direction of the Sewerage and Public Works Commission, and this sum was later augmented by $2,500, making a total of $17,000. The total amount expended was $16,990.78. Of this amount, $483.63 was required for cleaning, flushing and repairing sewers; $3,520.37 was required for the sewage disposal plant.

A Month of "Near Calamities." Why?

Sanitary and Heating Engineers Have Been Busy Remedying Defects — Furnaces Have Exploded, Water Closet Bowls Have Frozen and Broken, Water Pipes, Range Boilers and Water Fronts Have Burst and all Because of Carelessness

THERE never was in the history of Canada such a shortage of coal. There never was in the history of Canada such a big waste of coal. Why? The country is suffering from severe fire losses. Again let us ask why?

It is estimated that over $50,000,000 worth of coal is being wasted every year in Canada, and a part of this fuel is indirectly being used to cause such calamities as took place in Peterborough, Ont., on Friday, January 25th. It is estimated that several hundred water closet bowls have frozen and burst within the last month or so, and scores of hot water furnace sections have exploded. Range boilers and water fronts, too, have done their quota in causing damage.

The strange part of all this is that few, if any, lives were lost, and we fear very much whether there will be any steps taken to guard against such accidents until they cause some loss of life among the wealthy class.

Last winter several lives were lost in Ontario owing to careless installation; not necessarily carelessness on the part of those who are at present engaged in installing our heating appliances, but rather because of the fact that there are no heating by-laws in Canada. Any person in Canada is permitted to put in heating systems in any building, no matter how impractical he may be; so long as he can cut and thread a pipe, that is the limit of his qualifications. The Government of Canada is not interested in the lives or health of its people. It is more interested in all manner of cure-alls rather than preventive measures. It would rather instal wrought iron pipe in its buildings than cast iron pipe, in spite of the fact that it has been proved time and again that the former pipe is not suited for the purpose to which it is to be put.

The members of the Government are not practical men and will not listen to practical suggestions.

We are wasting fifty million dollars' worth of coal annually, which could easily be saved if a heating by-law were put into force. We could save several million dollars by having a Federal health department put into operation in this way.

Every building which may at some period have to be occupied by human beings will have to be furnished with heat. Some kind of drainage system and sanitary appliances will be required, and in this climate these appliances will get out of order if not clear of frost. Then there is the fuel loss caused by impractical heating systems being installed; there is the loss in human lives caused by poor ventilation. Our homes and buildings are just thrown up by jerry builders, and few, if any, laws are there that demand that any ventilation be provided. Every once in a while we hear of a serious fire loss, and the cause of these fire losses is oftener thon not either defective furnace installations or defective electric wiring.

If, however, there were to be a Federal health department formed, divided into two sections—medical and mechanical—the former could take care of present sickness, the latter could prevent any further unnecessary sickness, and at the same time save millions of dollars.

We stated that over $50,000,000 worth of coal is wasted in Canada every year. This is, of course, based upon the present population. With an increase in population and no improvements in coal consuming appliances the above figures will increase.

At the present time there are all manner of appliances that could be installed in connection with heating systems and power plants that would result in saving this money. For example, no steam power plant should be allowed to exist that is a waster of fuel. Steam once generated should not be wasted by being allowed to flow into the atmosphere. Steam traps of some kind should be installed so as to return water of condensation back to the boiler. Some of our readers may think that once steam has done certain work that its usefulness is at an end. Nothing of the kind. It requires a certain volume of steam at a given pressure to do a predetermined amount of work. After this work is done, the steam should be in some manner or other condensed to water. This condensation should be used as feed water, because for every cubic foot of steam atmospheric pressure one cubic inch of water must be fed to the boiler to replace that cubic foot of steam. And this condensation is without doubt sure to be higher in temperature than cold water would be. Therefore, less fuel would be required to raise this water of condensation back to steam. This argument is just as applicable to low pressure steam heating systems as with power plants, and from actual tests as high as 30 to 50 per cent. of fuel has been saved by the installing of steam traps.

Next we have the steam radiator trap. No radiator these days should be installed lacking some well tried type of return steam trap for this reason. In a steam heating system steam is generated for the purpose of raising the temperature of certain enclosed atmosphere. It is, therefore, necessary that all the possible heat units thus generated be made to do a certain duty: that of heating the surrounding atmosphere. A good radiator trap that will pass water only and will not pass steam is then very necessary. Why? Because if steam is allowed to return and condense at or near the boiler the condensation in this case is too hot, and being too hot, it will not absorb the heat units in the fuel, which in the case of a heating system is almost constant; whereas if the steam is held back by the return steam radiator trap the condensation is cooler, and being cooler, will absorb the heat in the fire; otherwise this heat is bound to go up the chimney and is lost.

Next, there is the controlling of temperature in our buildings. This is very necessary for several reasons. In the first place because of the fuel that can be saved and second because of the fact that sudden variation in temperature is unhealthy.

A furnace is installed, no matter what type, whether steam, hot water or hot air. A fire is put into the furnace. Drafts are set so that the fire will burn, it is left and long after the desired temperature in the rooms has been secured, the fire still burns on, a considerable amount of fuel is thus wasted.

Then the life of the fire is thus shortened, and the temperature goes down. More coal is shovelled into the furnace and very likely the fire burns low before the morning and the atmosphere in the home or building is so low in temperature that the fire again requires further attention. Time is wasted, no regular temperature is to be procured; fuel is wasted and all because of the fact that no heat or temperature controlling device is fitted to the heating system.

Next in line is humidity. The very highest medical authorities declare that humanity suffers terribly as a result of insufficient humidity in our homes, and it is no doubt true. We know that a dry atmosphere at 70 degrees F. does not appear to be as invigorating and warm as at 65 degrees F. with the proper proportions of humidity in the atmosphere. This is a health matter as well as a saving of money, though we must admit that the latter argument regarding the fuel saving by humidifiers is somewhat controversial. One thing we do know that proper heating, ventilation and humidifying appliances all under control will result in better health and save at least $50 000 000 worth of fuel in Canada in one year.

Now, how can this saving be effected? By having laws or by-laws put into force that control the installation of all heating systems. Even where stoves are used some provision should be made to prevent fires, and at the same time to secure all heat units possible to warm the building. Range boilers should not be put under city pressure neither should

any type of heating system. No expansion tank for a hot water heating system should be installed in a place where it is exposed to frost, and instructions should be given to every householder regarding the necessity of keeping this tank free from frost.

The fire at Peterborough, if we are properly informed, was caused by the exploding of a hot water furnace and this could only be possible if the expansion tank or pipes leading thereto became stopped, very likely frozen; there being no vent of any kind once the expansion tank became frozen, of course the furnace must explode, and a loss of $500,000 was the outcome. There is not a city in Canada that may not suffer from just such a cause, all because there are no heating by-laws in force. Every heating system should be installed in a practical manner, by practical men and be finally inspected by practical heating engineers, and a lot of work can be done at a great cost before the sum of fifty million dollars plus all the half million dollar fires is spent.

In conclusion our readers are asked to report to the editor any case of a fire or other damage that has come to their notice during the last 5 years. The information will be kept confidential except that we purpose sending it to the government, keeping the source of the information on files.

The SANITARY ENGINEER believes that a heating ordinance would be a boon to the trade, as well as to the whole of the Canadian people and the time was never more opportune than now when everybody is calling out save, save, thrift, thrift. Readers of SANITARY ENGINEER can help in no small degree by furnishing us with the evidence asked for.

TRADE JOURNALS EXHIBIT

Newark Library and Museum

Twelve hundred of the larger and more important trade journals of the country are shown by the Newark Museum and the Newark Public Library from Jan. 10 to Feb. 12. They are so displayed that each magazine may be comfortably handled and examined by visitors. The management asked that copies of SANITARY ENGINEER be furnished, because they felt that it was worthy of a place in this wonderful exhibit.

Trade Journals and the Museum

The Newark Museum is dedicated by the terms of its charter to the "exhibition of articles of art, science, history and technology" and to "the encouragement of the study of the arts and sciences." By what reasoning does it justify itself in giving 200 feet of wall and table space to a display of trade journals?

Industrial Exhibitions in Newark

In Newark, an industrial city, is a museum developing in line with the new museum movement. Two large industrial exhibitions have been held which together had an attendance of over 80,000 people. In its collection of lending material for teachers are about 800 exhibits illustrating industries of all kinds, from the raw materials to the finished product, so arranged and labelled that they may be understood by school children. These exhibits are lent to the public school teachers.

Museum and Manufacturer

That these exhibitions, frankly commercial, but developed by museum methods along lines of popular undertaking and appreciation of the methods of production, are valuable to manufacturer as well as to visitors, we are convinced. Not only does the public, through such exhibits, become a more intelligent purchaser, but the many requests received from business men for information about definite products and manufacturers represented prove that such industrial exhibitions have direct advertising value as well.

But in all these things the new museum needs the active help of the manufacturer. He must be willing to co-operate to the extent of providing materials for exhibition. He should open his factory or industrial plant to the museum worker so that by a first hand understanding of processes the material may be handled most intelligently. He should provide as far as he safely can certain definite information for the labels. He may well afford to give the museum the advice and service of his publicity man. He will lend machinery and a skilled operator when possible for a short time.

The museum in return can make his product more intelligible to the public, can present it in a new light in its relation to other products, and provide it with a background and a setting which will arouse discriminating interest in the thing itself. The new museum directs its appeal particularly to the school children, those who are rapidly becoming the purchasing public.

(Continued on page 23.)

TABLE—1

DATE OF ART.	NAME OF HUMIDIFIER	WHERE PLACED	SOURCE OF HEAT OR ENERGY	NAME OF MANUFACTURER OR JOBBER
15 Oct., 1917	Evaporating Pan	On Stoves, radiators, hung to register faces, etc.	Any heating system.	
	Buddington Humidifier	Top of radiator coil	Hot water, steam, vapor	Reid Geisler Mfg. Co., 5238 Ravenwood Ave., Chicago, Ill.
	"Moistair" Furnace Automatic Humidifier	Water pan in hot air furnace	Hot air	The Beckwith Co., 114 Front St., Dowagiac, Mich., U.S.A.
	Trico Humidifier	Top of radiator coil	Hot water, steam, vapor	Art Metal Radiator Co., 113 W. Washington St., Chicago, Ill.
1 Dec., 1917	Eureka Humidifier	Back of radiator coil	Hot water, steam, vapor	Eureka Blotter Bath Co., 6217 Wentworth Ave., Chicago, Ill.
	M.M.O.C. Health & Economy Base	Circular pan in base of furnace	Any heating furnace	The Sanitary Heating Engineering Co., 523 Bank St., Ottawa, Ont.
15 Dec., 1917	Turbo Humidifier	Overhead on pipe lines	Separate system requiring compresed air	The G. M. Parks Co., Fitchburg, Mass., U.S.A
	Normalair Humidifier	Any convenient place in room	Electrically operated	Yuile & Co., 285 Beaver Hall Hill, Montreal, Que.
	On Doody Vapor Heating System	On radiator, the vapor vent replacing the air valve	Vapor	Doody Vapor Heating Co., Inc., Boston, Mass., U.S.A.
1 Jan., 1918	Steam and Vapo Humidifier	On steam and vapor radiators or pipe lines	Steam and vapor	Air Moistener Co., 28 N. Market St., Chicago, Ill.
	Hyge-donor	Attached to furnace	Any heating furnace	W. J. Wall, 136 Bleury St., Montreal, Que.
	In Garrecht Furnace	In fire chamber	Hot air	Haynes Langenberg Mfg. Co., St. Louis, Mo., U.S.A.
15 Jan., 1918	Dr. Bryce's Humidifier	Above furnace fire	Any heating furnace	Gordon and Egan, 87a Mansfield St., Montreal, Que
	Gordon and Egan Humidifier	Above furnace fire	Any heating furnace	Reid Geisler Mfg. Co., 5238 Ravenwood Ave., Chicago, Ill.
	Buddington Humidifier	Floor and wall registers	Hot air	
	Buddington Automatic Humidifier	At top of furnace	Hot air	Reid Geisler Mfg. Co., 5238 Ravenwood Ave., Chicago, Ill.
1 Feb., 1918	Carrier "Type C" and dew point, Air Washers, Humidifiers, Heaters	Installed in connection with indirect heating system	Steam or separate heaters	Carrier Engineering Corporation, 39 Cortlandt St., New York.

At the request of quite a number of our readers we have published above the list of humidifying appliances and manufacturers of same that have been described in the series of articles recently concluded.

Apply a Cost System to Your Business

A Cost System is Simple as This Article Shows—A Knowledge of the Cost of Doing Business is Both Satisfactory and Essential—It Causes the Merchant to Speed Up Sales and to Abandon Cut-price Sales—Getting a Profit on Effort as Well as on Capital—This in Addition to Your Salary.

By John C. Kirkwood

THE very first thing to be done by the man who would know his selling costs is to know and record the various items that together constitute the cost of doing business. To know and record these items calls straightway for methodical accounting. Fortunately the separation, calculation and recording of the various items constituting selling cost are exceedingly simple operations, within the ken and ability of any man.

To ascertain the cost of doing business:

1. Charge interest on capital.

   Charge the rate of interest it would earn if invested in gilt-edge mortgages or bonds, say 6 per cent. By capital is meant net assets—inventory, cash, accounts receivable.

2. Charge Rent.

   Charge rent even if you own your premises. Should this be the case put down as rent the amount they would bring if occupied and used by another—say 8 per cent. of market value, plus repairs, taxes, and water.

3. Charge Your Own Salary.

   Put down an amount representing your salary worth to your business—a sum probably double that paid your highest paid employee. Include in this the worth of the services of any member or members of your family not on the pay roll, yet who render your business a service worth real money.

4. Charge Salaries of Hired Help.

   Omit from this, if you are so minded, the salaries or wages of the one or more engaged mainly or solely in the work of delivery, charging such wages under the item of delivery.

5. Charge Fixed Expenses.

   Included here are such determinable or known items as insurance (fire, casualty, plate glass, partnership), taxes, telephone rental, water rates, light and fuel.

6. Charge Freight.

   Include here freight and express on incoming goods; the cost of packages or packing, drayage; duty paid (if any).

7. Charge Delivery.

   Include here wages of drivers or messengers; horse and wagon, or motor car; stable or livery or garage items; repairs, supplies, freight and express items on outgoing goods, wrapping papers, packing, twine, etc.

8. Charge Incidentals.

   Include here stationery and office supplies, postage, telephone calls, telegrams, exchange, cleaning, miscellaneous repairs, etc.

9. Charge Advertising.

   Include here newspaper and other forms of publicity, including printed matter, catalogues, novelties and other disbursements properly coming under this head.

10. Charge Donations and Subscriptions.

    Include here special discounts or allowances made, or goods given in the name of charity, benevolence and good-will.

11. Charge Losses.

    Include here bad debts, shrinkage, leakages, shortages, thefts, spoilage allowances, discounts, and losses not provided for elsewhere.

12. Charge Interest Paid.

    Include here interest paid on borrowed money, and interest lost on uncollected book accounts, and cash discounts forfeited because of inability to take them.

13. Charge Depreciation.

    Include here the depreciation on buildings owned and employed by you in your business; and depreciation on furniture, fixtures, horses, vehicles, stock, etc.

Here one has a baker's dozen of headings under which to record the many items that constitute, when aggregated, the annual cost of doing business.

Many take stock on or about January 1. If this is your practice you will be in an excellent position to begin right away doing business on the basis of the known cost of operating your business.

Success is becoming more and more dependent on a knowledge of the cost of doing business and on intelligent, purposeful and successful effort to recover this cost plus a profit on your effort.

The accompanying article will prove very helpful to those who want to be successful merchants. The matter is set forth lucidly and soundly, and we sincerely trust that many of our readers will resolve and keep their resolve to conduct their business on the basis of known and actually recovered costs, plus a desired profit on effort.

Easy to Record Selling Costs

With these headings and helps it should be a simple matter for any dealer to set down his selling costs, day by day, week by week, month by month, quarterly, semi-annually and annually.

Each individual disbursement has to be recorded sometime, somewhere, somehow. Why not record it in its right place at the right time and under its proper heading? Thus will the dealer have the record or records necessary and desired. He will know then just what it is costing him to run his business.

Costs Studied More Closely

In the foregoing presentation of group headings some may possibly be merged with others. For example, Advertising may be included under Incidentals; and Interest may be included under Losses. Donations and Subscriptions may be included under Incidentals. But there is an advantage in the separation of these several classes of expense: They reveal boldy, challengingly and perhaps shockingly classes and amounts of expenditures capable of reduction, and perhaps calling for reduction.

Also in the foregoing presentation of the factors of selling costs, Freight on incoming goods is included. Many will say that Freight, Express, Drayage and Packages or Packing should be added to the invoice price immediately; and in saying this they are quite correct. But not always is this class of expense included in the marked cost price of goods. On articles of heavy weight—such as sugar, nails, coal, for example—the freight expense is immediately added to the invoice price by all wise dealers, but on many lines the practice of many dealers is to ignore in their cost marking the item of freight, or delivery-to-store expense. Accordingly, in the enumeration of the factors of cost, as above, Freight is set down, and when this annual aggregate expense is reduced to a percentage of sales, it can quickly be added to invoice prices. For this reason is Freight on incoming goods included among the factors of costs.

Recovering One's Losses

Under the heading of Losses are to be assembled all such expenses and losses not properly belonging under other headings. Bad debts should be charged here, for so will they be recovered by being assessed against all customers as a whole. Leakage, shortage, shrinkage and spoilage should be charged here, for thus will their costs be recovered.

The average dealer treats bad debts, leakage, shortage, shrinkage and spoilage as irrecoverable, but this view and practice are unsound and dangerous.

All such losses should be charged into the cost of doing business, so they may be collected and recovered.

Leakage, shortage, shrinkage, and spoilage, in the aggregate, may amount to a very considerable item, and are incident to the doing of business, to providing the public with a service needed and desired by them. Therefore the public as a whole—the dealer's customers as a whole—should pay for such losses.

DO YOU KNOW?

A competent authority has, by careful investigation of over 1,500 *retailers in each line, and in every section, developed the following facts:*

	Turn Stock per year No. Times	Cost to Do Business Per Cent.
Grocers	10	16
Dept. Stores ..	7	26¼
Druggists	4	24¾
Dry Goods	4	24
Hardware	3½	19½
Furniture	3	24
Shoes	2	23¼
Clothing	2	20¼
Jewelers	1½	25¾

When Goods Are Sold Below Cost

Under the heading Losses can be included the loss sustained in the sale of staples that do not and will not, as things are, bear their proper percentage of advance to cover the costs of doing business. Sugar and nails are two familiar and common examples of merchandise which sell retail at a very small percentage advance on invoice cost. Suppose that the actual cost of doing business is 25% of the invoice price, and a staple sells at an advance of only 10% on invoice price, then there is a clear loss of 15% on the annual sales of this particular commodity. The total loss, as represented by this 15% loss, should and must be recovered, and, therefore, must be collected in the sales of merchandise on which can be imposed the full costs of doing business.

Interest on Outstanding Accounts

Under the heading of Interest Paid there should be included the interest lost on outstanding accounts. These accounts may total, say, $1,000 at any and all times during the year—this in a business done on a capital of $5,000 or so. They represent non-earning capital. But capital should bear interest. Reckoning interest to be earned at 6%, there would thus be an item of $60, when the average amount outstanding is $1,000, to be charged as an operating cost.

Providing For Depreciation

Under the heading of Depreciation should be included all items relating to property, furniture, fixtures, and delivery equipment whose inventory value diminishes each year through use, loss of style, etc., wear or damage and which in the course of time require to be discarded or replaced. The percentage amount of annual depreciation for each article or possession will probably vary, being 5% in the case of a possession good for 20 years, 10% in the case of a possession good for 10 years, and 20% in the case of a possession likely to require replacement in 5 years.

A special bank or ledger account should be opened for charges of this sort—a sort of sinking fund account, which can be reckoned as capital. In this way the money necessary for replacing worn out or useless or valueless equipment will be provided systematically, and will be instantly available when needed.

Recording the Items of Cost

The thing remaining is the essential thing—the recording of these costs methodically, fearlessly, and accurately—and in recovering them from sales. This is the hard thing—hard because of the average business man's lack of system, will power, resolution and well-disciplined habits. You can lead a horse to the water, but you can't make him drink. You can show a merchant how to ascertain and recover his selling costs, but you can't make him record and get them back. It is a matter for the individual himself whether or not his performances shall be in accord with his knowledge and conscience. At the same time it is earnestly hoped, now that retailers have been shown how to ascertain, record and recover selling cost, that many of them will become possessed of the purpose, resolutely maintained, to conduct their business intelligently, knowingly, with full light on matters that aforetime may have been hidden in darkness.

WHY BUSINESS MEN FAIL

According to a statement by Edward N. Hurley, vice-chairman of the Federal Trade Commission, there were 22,000 *failures in the United States in* 1915. *Ninety per cent. of them resulted from cut-throat competition prices. In an investigation made by the commission since its appointment,* 200,000 *out of* 260,000 *firms had no method of determining cost; of these,* 100,000 *firms did not earn a penny, and little, if any, provision had been made for depreciation. In another survey of a national industry it was found that twenty-seven large corporations, representing an investment of* $12,500,000 *and annual sales of* $8,000,000, *had earned only* $300,000—*a little less than* 3 *per cent. on the capital stock, and altogether they had charged off only* $69,000 *for depreciation. The number of small businesses run on odds and ends or on bank check stubs is amazing*

Getting a Profit on Effort

In what has been said, the matter of getting a net profit on one's effort has not been considered. Provision has been made for a salary for the proprietor or partners; but the matter of a profit over and above all costs of doing business is a thing by itself. The desired profit—$1,000, $2,000 or so—must be added to the costs of doing business as above defined and elaborated, and the sum of the costs of doing business and the profit on effort desired will give the merchant the full sum he must obtain in a year over and above the invoice cost of goods sold. For calculation purposes the cost of doing business should include the sum one desires as profit on his effort.

STOCK AND HOW TO KNOW IT

You must know your stock and its weaknesses at all times.

You may be passing merchandise through your place of business at a loss.

The only system which successfully stands the test is organized, systematized and daily visualized business.

The wiser the man and the better the institution, the closer is everything watched, and the less guessing indulged in.

The easiest way to take stock is to prepare for it.

Sales Must be Stimulated

But putting down all costs and adding the profit on effort desired is not any guarantee or pledge that the merchant will get this gross sum. To get this sum he must sell enough goods—must have a minimum annual turnover, and must obtain an advance on invoice cost of goods sold sufficient to give him all costs plus the desired profit.

Suppose, for example, that the costs and profit, as above set forth, total $5,200 in the year, or a neat $100 a week. Then it becomes clear that the merchant must sell enough goods each week, on an average, throughout the entire year, to give him $100 a week above the invoice cost of his goods. Suppose his average advance on cost is 25%, then it means that his average weekly

HOW TIME INCREASES COST

In an eight-hour day you have only 480 *minutes. Thus, whenever you waste five minutes you decrease your value* 1 *per cent. Your stock falls from par to* 99 *per cent. If you waste* 50 *minutes your stock falls to* 90, *and so on. Few of us ever have a day at par. If you borrow* $120,000 *at* 5 *per cent. you are paying* 4 *cents a minute. If your accountant makes a mistake, and you borrow it a day too soon he causes you a loss of* $20. *Many a business man has gone down to bankruptcy because he did not realize this ruthless persistence of interest. Interest is like the tortoise in the well-known fable—it is slow, but it never stops to rest.—System.*

sales must be $500, of which $400 will represent invoice costs, and the other $100 the gain over cost. $500 a week sales means an annual turnover of $26,000.

If the merchant averages only 20% advance on cost, then it means that to obtain weekly $100 above invoice costs, he must have average weekly sales of $600, made up of $500 invoice costs plus $100 advance. In this case his turnover would require to be $31,200.

So it becomes clear that if turnover (goods sold) falls below $26,000 in the one case, or $31,200 in the other case, the costs of doing business, plus the required profit for effort, are not obtained.

When the merchant perceives in advance—which he can—just how much he must sell yearly and weekly to recover his costs and obtain his desired profit, he knows just what effort he must put forth to keep up sales to the necessary weekly minimum. Certainly he dare not go on, trusting to luck, as so many do; nor will he be content with just hoping and trusting; on the contrary, if he is made of the right stuff, he will speed up his sales and his sales staff, and begin to study his business as never before. He will do his utmost to swell the sales of goods on which he can obtain an advance over invoice cost of 30%, 40%, 50% or more; and he will not be overeager to spend much time, or have his staff spend much time, in selling goods on which only 10% or 15% or so is obtained over invoice cost. Also, he will not be very enthusiastic about bargain sales or clearance sales when ordinary or regular prices surrender all or nearly all the advance over cost contained in them. Big turnover in which there is insufficient advance on invoice price will look less good than a smaller turnover which contributes an adequate advance over invoice cost.

All this goes to prove that being a real, profit-making merchant is something vastly different from being just an ordinary storekeeper.

Analysis a Secret of Success

Analyze! This is one of the first words to be learned in the language of efficiency. Always it should be remembered that the prudent man who has an ideal record of costs, and applies his knowledge practically, is the one who out-distances all his competitors in the long run. Also, one needs to remember that 90% of the men in business are getting no profit from their effort—this because they are ignorant of, or unwilling to take the trouble to ascertain, the costs of doing business, and whether a profit on top of costs is being earned. The necessary knowledge is so simply and surely possessible and the trouble so very minor, that one wonders why any dealer should continue ignorant or indifferent, especially when ignorance and indifference are robbing him of due compensation or remuneration for the labor and skill required on his part in the conduct of his business and for the risk involved—the risk of his capital.

COMMERCIAL FAILURES

Taking it all round, 1916 was the best business year the United States ever experienced; yet there were seventeen thousand business failures. Compared with twenty-two thousand the year before, this is encouraging; but practically one out of a hundred of all concerns in business failed, and, year in and year out, through good times and bad times, the proportion of failures never varies very far from one per cent.

In only two hundred and sixteen of the seventeen thousand failures did the liabilities exceed one hundred thousand dollars. Nearly all the failures, in other words, were of small concerns.

Credit men assign many reasons for these failures, such as lack of experience, insufficient capital, injudicious extending of credit, overbuying — which merely means unwise buying—and so on. But we venture to guess that one cause was present in nearly all of them, to wit, poor bookkeeping. They did not keep books so as to know exactly what it cost them to do business and precisely how they stood all the time.

We recommend again to every business concern an accounting system that will show costs accurately —Saturday Evening Post.

CRYSTALLIZATION OF COLD WROUGHT STEEL

It is a matter of fairly common experience that cold wrought steel, whether in the form of cold drawn wire or tubing, cold rolled rod or sheet or strip, or cold pressings, is given to occasional breakages for no apparent reason under stresses much below those which might be accounted safe. The trouble has long been known to be due to crystallization, but the conditions governing crystallization in cold wrought steel have until late years defied analysis. Recent investigations, however, are throwing a good deal of light on what has for so long a time been a mystery.

It appears that the formation of coarse grains in the metal is conditioned by the amount of reduction in sectional area which it undergoes in the working, and by the annealing temperature to which it is afterwards subjected; and that there is a danger zone as regards both these processes, within which grain formation may be especially looked for. Reductions of area up to 8 per cent. appear to have no deleterious effect of the kind mentioned, but at 9% a critical strain seems to occur which is favorable to crystallization. From 9 per cent. upwards the size of the grains induced by working steadily diminishes, and at 25 or 30 per cent. they become once more normal, so that reductions of over 30 per cent. in area are not found to cause any grain growth. The danger zone so far as reduction of area is concerned is thus found in reductions of between 9 and 30 per cent.

It has been further noted that the coarse grains develop during annealing and that their growth is largely dependent upon the temperature at which the subsequent annealing process is carried out. The investigations go to show that with sectional reductions of about 9 per cent. or less, the temperature range within which grain growth occurs on annealing lies approximately between 690 and 780 degrees Centigrade. Annealing above the higher temperature completely refines the grain.

On the other hand when the reduction of area is greater than about nine per cent. the range of temperature within which grain growth occurs on annealing falls approximately between 650 and 900 degrees, a higher temperature than 900 degrees again resulting in complete refining.

It follows from these observations that immunity from the development of crystallization can be secured by keeping the annealing temperature below 650 or in certain cases 690 degrees. This heat is for the most part sufficient to remove the effects of cold working, but sometimes a higher temperature is called for, and in such cases the furnace should be brought up to 900 degrees, although in certain cases annealing at 780 degrees will refine the grain sufficiently to prevent trouble. Grain growth occurs only in low-carbon steel, and if a steel can be used that has more than 0.15 per cent. carbon content no growth need be feared. Where low-carbon steel must be used grain growth can be avoided by the use of comparatively heavy operations on the metal, or by proper selection and control of the annealing temperature, according to working conditions. If the material is not annealed no grain growth can occur, but non-annealed cold worked steel is, of course, subject to weaknesses of other kinds.—"Scientific American."

THE geography lesson was about to begin, and the subject of it was France. Accordingly, the teacher started off with the question: "Now in this present terrible war, who is our principal ally " "France" came the answer from a chorus of voices. "Quite right," said the teacher, beaming. "Now can any of you give me the name of a town in France?" A small boy at the back of the class almost fell over in his eagerness to tell: "Somewhere," he murmured breathlessly.

THE small Scotch boy was in a great hurry, and accordingly thought he would take a short cut through a plowed field; but the farmer, happening to observe him, shouted angrily: "Hi, there's no road there!" The boy turned round sharply, but seeing that at least twenty yards lay between him and the farmer, cooly retorted, "So I see, but you needna trouble to mak' one. I'll no' likely be back this way again."

SANITARY ENGINEER

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VOL. XII. FEBRUARY 15, 1918 No. 4

ENCOURAGING AT LEAST

IN Buffalo recently at one of the Buffalo Master Plumbers' Association meetings, the question arose of charging for time taken in submitting estimates. It was pointed out that it required the best and most competent men engaged in the trade to do this kind of work, that valuable time was spent, and that only one sanitary or heating engineer could procure the contract, when as a matter of fact sometimes as many as twenty were asked by architects and builders to submit tenders.

However, it is encouraging at least to be informed that quite a number of Buffalo craftsmen have for some time made a practice of charging for the time spent when preparing estimates.

It was pointed out that a number of architects and contracting builders who previously had been in the habit of asking quite a large number of sanitary and heating engineers for tenders were now calling fewer tenders on each job, and paying the fees charged. This not only saves a lot of time for the members of the trade but all such fees collected go a long way towards reducing the amount of overhead expenses, which are always borne by the customer who must eventually pay for services rendered.

SANITARY ENGINEER has advocated such a scheme for several years past. Members of the trade may put up signs, advertise and say that they give estimates free, but they do not. Someone has to pay and in this case it is the regular customer. The sanitary engineer who advertise "estimates free" practically says "Come in! I'll give you expert advice. I make my regular customers pay for my time in my overhead expenses, so unless you become a customer it will cost you nothing."

It seems paradoxical that in these days of enlightenment we should give time away so freely. Time is the only real asset this world possesses. Time is the only asset that neither fire nor water can destroy. It is indestructible, but can be wasted, and when wasted or given away it demands compound interest. Then why should sanitary and heating engineers or any other trained tradesman give his time free?

A HEATING BYLAW

IN THE city of Toronto the public are at last becoming interested in the question of heating their homes. Many individuals have expressed themselves as being of the opinion that the plumbers and steamfitters are to blame, that the heating appliances they install are not capable of furnishing the necessary heat, no matter how the furnaces are fired, and in all views expressed it is the heating men to blame. The city architect, Mr. Pearse, has been asked, and from what can be learned instructed, by the City Council to draft a heating bylaw governing the installation of all heating appliances in Toronto homes.

If the Toronto people, or even the whole Canadian public, could be made to realize that wherever a civic architect is employed they have more to do with fuel waste, even than the furnaces installed, they would be on the right track.

If our civic architects would turn their attention to making all buildings erected under their jurisdiction wind and weather tight, the furnaces that are installed would heat the buildings much more satisfactory than at present.

It must not, however, be taken for granted that there should not be a heating bylaw put into force. There certainly should be such an ordinance, but not purely local or provincial. Neither should any civic architect assume the duty of drafting a heating bylaw.

The writer knows of hundreds of furnaces right here in the city of Toronto, the sizes and types of which have been specified by the architect on the job, and these furnaces were and still are neither the proper size nor type suitable for the buildings in which they are installed.

What do all these statements prove? That it is high time that all heating installations should be under the jurisdiction of competent heating engineers and that all heating boilers, whether high or low pressure, whether hot water or steam, should be inspected annually. We will show why in our next issue. We would like very much to have a few of our readers express their opinions to the editor, with a view of remedying the situation. There is too much fuel being wasted, too much damage being done, and the public are not being told the real truth, or they would not be too ready with their denunciation of the heating engineer.

The Economical Use of Soft Coal for Heating Houses

How to Get Maximum Heat With Minimum Consumption of Fuel — Correct Method of Coking—Hints on Chimney Construction—Useful Talking Points For the Sanitary Engineer

From the "Heating and Ventilating Magazine."

A TIMELY circular on the purchase and use of soft coal for house heating purposes has recently been compiled by the Engineering Experiment Station of the University of Illinois. Among other things, the more important factors involved in the installation of a satisfactory and economical house-heating system are discussed, and the most economical methods of firing soft coal and operating a house-heating plant are presented. For the convenience of the householder who desires to place his heating system in proper condition to derive the benefits of great economy from its operation the most vital installation and operating requirements are summarized.

The order in which the several phases of the subject are discussed corresponds with that in which the householder normally considers them. In the early summer he looks over his heating system to see that it is in proper condition for the next heating season; next he purchases his coal; finally he is concerned with the problem of operating the system in a manner which will produce the best results.

The information contained in the circular was compiled under the direction of a committee, of which A. C. Willard, assistant professor of heating and ventilation at the university, was chairman.

After discussing the requirements to be met by a satisfactory house-heating installation, as shown in Figs. 1, 2 and 3, the circular takes up the arrangement of heaters for burning soft coal. Soft coals, it is stated, which swell when heated and also coke, which is more bulky than coal, require larger fire boxes to permit a sufficient amount of fuel to be fired to last between reasonable firing periods. Fire-pots for soft coal, in many types of heaters, especially warm-air furnaces, are slotted (Fig. 4) or have a special air supply ring (Fig. 4) at the surface of the fire to introduce heated air, and thus to provide for more nearly complete combustion of the gases which come from such coal.

Down draft, cast-iron and steel heating boilers (Fig. 5) are now manufactured, and are used in large residences and apartment houses for burning soft coal without smoke, or with reduced quantities of smoke. In these boilers air is supplied from above to the fuel, which is burned on a grate composed of hollow bars or tubes containing water. This grate is so placed (Fig. 5), just above an ordinary direct-draft grate, that the volatile gases from the freshly-fired fuel on the upper grate pass down over the hot surface of the thinner well-coked fire which is kept brightly burning on the lower grate. The fire on this secondary or lower-grate fire acts, in the presence of sufficient air, to ignite and burn the volatile smoke-producing gases and sooty products which would otherwise pass through the flues of the boiler and up the chimney unburned.

In this way not only are the actual smoke-forming products consumed when the furnace is under proper regulation, but all the other burnable gases are completely consumed in the boiler itself, so that more heat per pound of fuel is made available for heating the building.

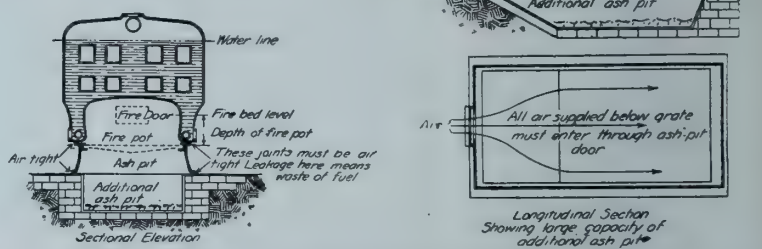


FIG. 1—APPROVED METHOD OF SETTING STEAM AND HOT WATER BOILERS TO PROVIDE ADDITIONAL ASH PIT.

Hints on Chimney Construction

The circular has some good hints on chimney construction. The use of fire-clay flue-lining throughout the length of the chimney is recommended, both on account of tightness in connection with air leakage, but also as reducing the risk of fire in the chimney.

Covering for warm-air pipes as well as for steam and hot water piping is recommended. For air, a 3-ply asbestos paper covering at least ¼ in. and preferably ½ in. in thickness is desirable.

Recirculation of air in warm-air furnace systems is endorsed by the committee. The recirculating duct, taking air from the front hall, instead of from out-of-doors, must be large and practically equal in size to the combined area of the warm-air leaders coming from the furnace.

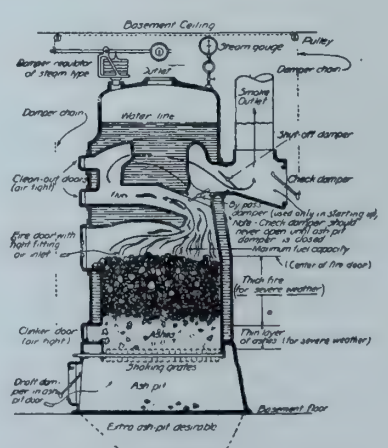


FIG. 2—TYPICAL STEAM BOILER, SHOWING NECESSARY DAMPERS AND DOORS.

The Humidifying Requirements

For supplying the necessary amount of moisture to the air, it is recommended that warm-air furnace systems be equipped with an evaporating tank or pan placed above the dome and just beneath the bonnet of the furnace where "it will receive heat enough to evaporate sufficient water effectively to humidify the air going to the rooms." An automatic ball-cock or feed-valve should be arranged in an external float-tank to keep the evaporating pan constantly supplied with water. A hand-control valve is needed on the line supplying the evaporator, and an overflow should be run from the float-tank. In very cold weather, with the furnace running at full capacity, the hand-control valve must be partially closed at times; otherwise too much water vapor will be sent into the house and the windows will become covered with frost. "The average water pan placed near the bottom of the jacket of warm-air furnaces," says the report, "is ineffective as a means of humidifying the air in a house."

As regards the equipment of steam and hot water heating plants with humidifying apparatus, it is stated that a satisfactory humidifying system is a

more expensive item than in warm-air furnace heating. Water pans on radiators are not generally capable of supplying sufficient vapor to be of any real value. This deficiency is especially true in the case of hot-water system, in which the radiator temperatures are lower than in a steam system. With a steam plant special valves or cocks may be connected into the steam pipes or radiators and may be used to "bleed" or supply steam direct from the system to the air of the room. This can be accomplished quietly, and if the valves are regulated in accordance with fluctuations in the outside temperature so as not to admit an excess of vapor, frosting of the windows can be prevented and a proper air condition maintained.

There is no simple and effective way of humidifying the air with a hot-water system. Recourse may be had to a large pan of water kept simmering on the kitchen stove with doors between rooms left open as a partial solution of the problem.

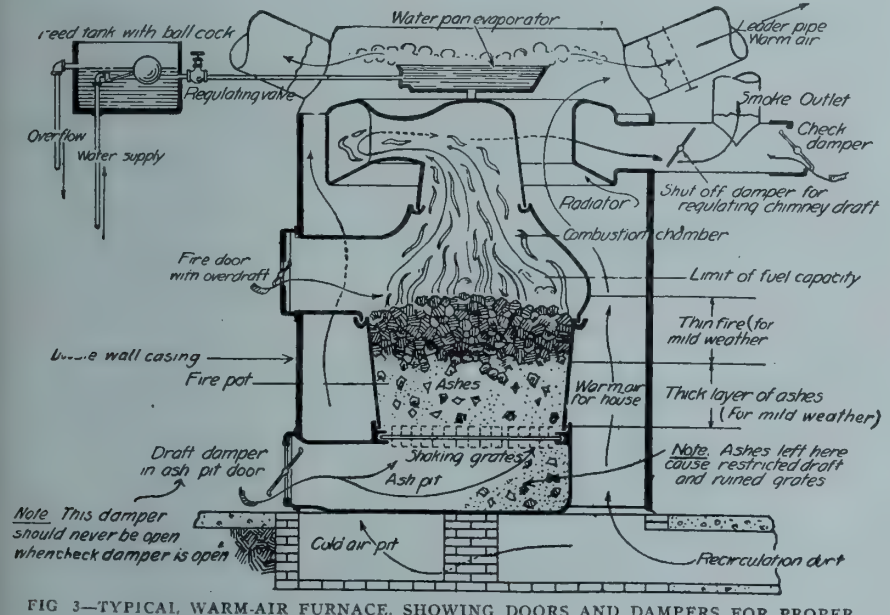


FIG 3—TYPICAL WARM-AIR FURNACE, SHOWING DOORS AND DAMPERS FOR PROPER REGULATION.

The Purchase of Coal

Among factors to be considered in the purchase of coal, attention is called to the fact that many users of large amounts of fuel buy their coal on the heat unit basis. It is pointed out that the case with the householder is slightly different from that of the large user. While the heat value of a coal is still the most important thing to be considered, other characteristics and factors have a relatively greater bearing upon the problem of the householder than upon that of the large user. The value of a fuel in a house heater is not dependent entirely upon its B.t.u. value. but to a considerable extent upon the skill of the fireman, the design of the furnace, the method of firing, and the several properties of the coal. For example, careful firing and attention will yield as good results with an 11,000 B.t.u. coal as indifferent methods of firing will produce with a 12,000 B.t.u. coal. Widely different varieties of coal should not be compared solely on the basis of their heating value. The greater convenience in handling and firing, lack of smoke and dirt, and the method of burning are all qualities which distinguish, for instance, the eastern coals from the Illinois coals and make them more desirable. How great a difference in price the householder is justified in paying for these advantages is, of course, a matter for the individual to decide for himself.

With reference to the selection of different Illinois coals, the B.t.u. value and the percentage of ash furnish a general guide to their relative values. The ash content directly affects the B.t.u. value, so that the relative value may be expressed with fair accuracy by the B.t.u. value alone, although the efficiency of any coal drops off more rapidly than its B.t.u. value when the ash content exceeds 10 per cent. or 15 per cent.

In order to enable the small consumer to judge as to the relative values of coals offered at different prices, the chart, Fig. 6, has been prepared to show the theoretical value of coals of different heating or B.t.u. values at various prices per ton. A close approximation of the percentage of actual heat-producing material in Illinois coal may be obtained by dividing the B.t.u. value of the coal by 155. Thus, a 12,000 B.t.u. coal contains 12,000 ÷ 155, or 77 per cent. of heat-producing material.

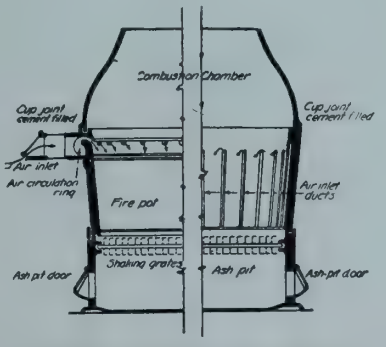


FIG. 4—TWO TYPES OF FIRE POTS FOR BURNING SOFT COAL WITH AIR SUPPLIED ABOVE THE FUEL BED

The householder should remember that the B.t.u. value, as shown by the test of a selected lump or properly-taken mine sample, does not necessarily coincide with the B.t.u. value of the coal as delivered. Ordinarily, the heat value of well-prepared coal purchased from reputable dealers does not vary more than 4 per cent. or 5 per cent. from the analysis of the mine sample. Advertised values based on "selected" samples may, however, prove misleading. Unscrupulous dealers sometimes take advantage of the householder's lack of technical knowledge and deliver poorly-prepared or improperly-sized coal which may be greatly deficient in heating value. The precautions which a householder may take against such a risk are: (a) buy from dealers who are known to be reputable and responsible; (b) examine the coal to see that it is free of impurities and is properly sized; (c) in an extreme case, in which the quality of the coal seems to have been grossly misrepresented, have a sample taken and analyzed by a qualified fuel chemist who understands the correct method of sampling.

(Continued in next issue.)

HIGH FINANCE

Here is a brain twister. A young fellow had three dollars, but was in need of four dollars. He went to a pawnshop and pawned the three dollars for two dollars; then he sold the ticket to a friend of his for two dollars. This gave him his required four dollars. The pawnbroker had the three dollars and his friend had the ticket. Who got the worst of the deal? Don't come to a hasty conclusion, but think it out.

A BEANY SYSTEM

There was once a plumber who wanted to keep track of all the postage he used. So he bought some beans, and every time he used a postage stamp he took a bean out of the bag and put it in the stamp box. He vowed that he never lost track of a single stamp and never lost a bean; so the system must have been perfect. We would like to hear of anyone adopting this bean system of accounting.

THE Sunday-school teacher was making a review of the lessons.

"Who was the wisest man, James?"

"Solomon."

"That's right. Now, Frank, who was the strongest man?"

"Jonah."

"Wrong. But what reason have you for believing Jonah was the strongest man?"

"'Cause the whale couldn't hold him after it got him down."

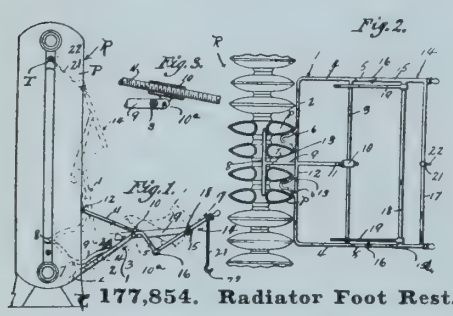
New Canadian Patents

No. 177,854.

Ellis Webb, Geneva, New York, U.S.A., 26th June, 1917; 6 years. Filed 2nd March, 1917. Receipt No. 276,420.

Claim.—1. A radiator attachment embodying a frame adapted to rest against the pipes of a radiator and having a portion to pass between and engage behind said pipes, and means carried by the frame movable against the radiator to bind the frame upon the pipes.

2. A radiator attachment embodying a frame adapted to rest against the pipes of a radiator and having portion to pass between and engage behind said pipes, and a member pivoted to the frame to



No. 177,854. Radiator Foot Rest.

swing against the radiator for binding the frame upon the pipes.

3. An attachment of the character described embodying a frame adapted to rest against the pipes of a radiator and having shank projecting therefrom to pass between said pipes, said shank having a T-head to engage behind said pipes, and a member pivotally connected with the frame and having a T-head to bear against said pipes.

4. A radiator attachment embodying a frame having a shank projecting angularly therefrom to pass between the pipes of a radiator, said shank having a T-head to engage behind said pipes, a sleeve pivoted to the frame opposite said shank, and a rod threaded through said sleeve and having a T-head to bear against the pipes.

5. A radiator attachment embodying a frame adapted to rest against the pipes of a radiator and having shank projecting therefrom, a rod opposite said shank and downturned portions adjacent said rod, said shank having a T-head to engage behind the pipes of the radiator ,a member pivotally connected with said rod and having a T-head to engage the pipes, a rack pivotally connected with said downturned portions, and bars pivotally connected with the rack and having notches engageable with said rod.

No. 177,763.

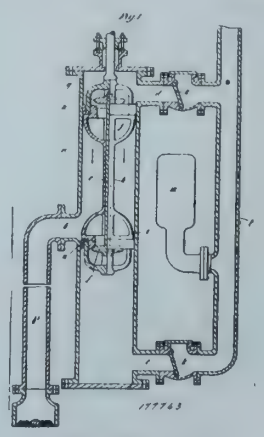
Walter James Grimshaw, Littlehampton, Sussex, and Alfred P. Symonds, assignee of a half interest, London, both in England, 19th June, 1917; 6 years. Filed 12th December, 1916. Receipt No. 273,094.

Claim.—1. In combination, a pump barrel having a central inlet and two delivery outlets one at each end, a pump bucket on each side of the inlet, means for connecting said buckets, and a valve in each bucket adapted to move axially relatively to the buckets so as to open and close alternately according to the direction of movement of the buckets.

2. In combination, a pump barrel having a central inlet and two delivery outlets one at each end, a pump bucket adapted to reciprocate within the barrel on one side of the inlet, a similar bucket adapted to work on the other side of the inlet, means for connecting said buckets to each other, axially movable valves associated with the buckets adapted to open and close alternately whereby the fluid admitted to the space between the two buckets may pass through the said valve closes.

3. In combination, a pump barrel provided with a central inlet and delivery outlets at its extremities, an arrangement of buckets adapted to reciprocate within said barrel so as to deliver alternately, and axially displaceable valves in said buckets adapted to direct the flow of the medium admitted to the pump barrel.

4. In combination, a pump barrel having a central inlet and delivery outlets at its extremities, a delivery main, branches conecting said outlets to the main, valves in said branches, a cushioning chamber also connected to said main, pump buckets in the pump barrel one on each side of the inlet, valves mounted at the extremities of a rod and passing said buckets, means for connecting the buckets to each other, and means whereby the opening of the valve in one bucket



No. 177,763. Pump.

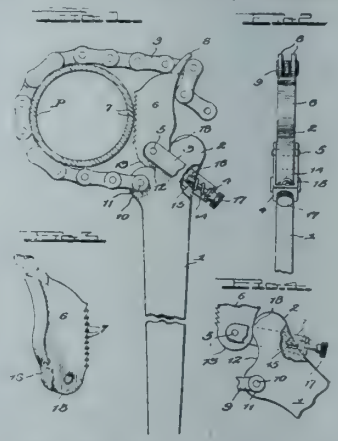
will effect the closing of the valve in the other bucket.

5. In combination, a pump barrel having a central inlet and delivery outlets at its extremities, two buckets connected together so that one operates on one side of the inlet whilst the other operates on the other side, and two valves, one seated in each bucket, and each valve adapted for axial displacement to open as its bucket approaches the inlet whilst as the bucket recedes from the opening said valve closes to enable the medium entering the pump to be discharged.

No. 177,980.

Seth Albert Plough, Traverse City, Michigan, U.S.A., 3rd July, 1917; 6 years. Filed 2nd April, 1917. Receipt No. 277,873.

Claim.—1. A wrench comprising a flexible gripping member to be passed around a pipe or the like, a handle con-



No. 177,980. Pipe Wrench.

nected to one end of said member, a moveable jaw having a connection with the other end of said member, and yielding means connecting the jaw and the handle, substantially as and for the purpose specified.

2. A wrench comprising a flexible gripping member to be looped around a pipe or the life, a handle connected to and projecting forwardly beyond one end of said member, a yoke into which the projecting front end of the handle is inserted, a jaw member carried by the yoke and having a connection with the other end of the flexible gripping member, and spring means in conjunction with the yoke retaining the jaw member in contact with the projecting front end of the handle.

3. A wrench comprising a flexible gripping member to be looped around a pipe or the like a handle connected to and projecting forwardly beyond one end of said member, a yoke into which the projecting front end of the handle is inserted, said yoke having a crossbar spaced from the handle, and the latter having therein a socket opening toward said bar, a jaw member carried by the yoke and having a connection with the other end of the gripping member, and a bolt slidable through the aforesaid

(Continued on page 23.)

New Sanitary and Heating Goods

DODD AUTOMATIC GAS HEATER

With the shortage of fuel, with the vanton waste that is going on in the consumption of coal, this new gas heater hould become a very popular appliance. A book is being published which describes the apparatus more fully; but it vill not be out of place to give readers of SANITARY ENGINEER a little advanced information as to the claims made on behalf of the heater. When off the press the booklet may be procured by writing to the inventor, H. Dodd, 11 Lauder Avenue, Toronto.

The cut shown explains the parts of the heater, which can be attached to any hot water or steam system without disturbing the existing piping. The attachment is made to the flow and return pipes, quite close to the existing furnace. The heater can be used as an auxiliary if so desired, or will handle the heating in the colder period. Any sanitary or heating engineer can make the installation at a small cost compared with the additional comfort obtained.

The thermostat and clock are usually placed in the living room, and are quite attractive arrangements, which will not detract from the existing surroundings. The thermostat can be set at the desired temperature by moving a little lever at the back. The temperature may be reduced on retiring for the night, say, to 45 or 50°, and reset to the usual degree an hour before rising, so that the house may be comfortably warm when dressing time comes. By this means a healthy temperature is kept without undue waste or inconvenience.

"The Dodd Automatic Gas Heater," say the makers, "has been tested under most severe and unusual conditions, both good mechanical and operating efficiency has been shown. While we are unable to make any guarantee as to gas consumption in any home, we do say with reasonable care and, considering the elimination of all labor, absence of dust, ashes, etc., the cost per season's run will show the Dodd Automatic Gas Heater is **cheaper than the coal furnace.** However, we can guarantee evaporation tests which have been carried out."

NEW CANADIAN PATENTS

(Continued frome page 22)

crossbar and projecting into the socket in the handle.

4. A wrench comprising a flexible gripping member to be looped around a pipe or the like, a handle connected to and projecting forwardly beyond one end of said member, a yoke into which the projecting front end of the handle is inserted, said yoke having a crossbar spaced from the handle, and the latter having therein a socket opening toward said bar, a jaw member carried by the yoke and having a connection with the other end of the gripping member, and a spring-pressed bolt slidable through the aforesaid crossbar of the yoke and projecting into the socket in the handle.

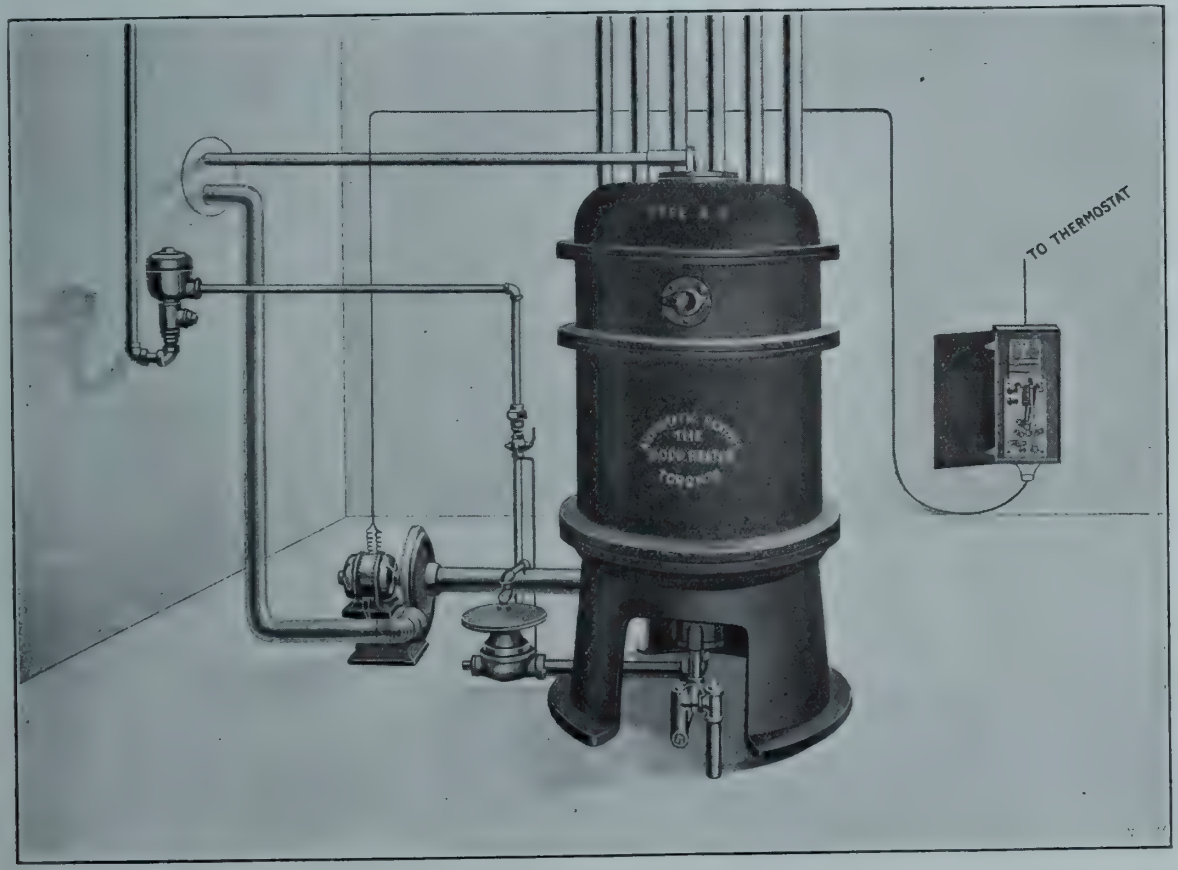
5. A wrench comprising a flexible gripping member to be looped around a pipe or the like, a handle connected to one end of said member, a yoke into which a part of the handle is inserted, a jaw member carried by the yoke and having a connection with the other end of the gripping member, and a spring-pressed locking device carried by the yoke and forced into contact with a portion of the handle, substantially as and for the purpose specified.

TRADE JOURNAL EXHIBITS

(Continued from page 15.)

From these temporary exhibitions much permanent material should stay with the museum, particularly material which may be used in making up lending collections for schools.

Commenting up the above exhibit we feel that this is a splendid work. It is just such undertakings that help build up creature minds in our young people. The world at large has yet to realize the importance of the library and its workers, particularly such as are interested in work of this nature, viz., that of collecting, compiling and loaning of technical and trade journals.—Editor



The Dodd Automatic Gas Heater.

Market Conditions and Tendencies

Statements Regarding the Prices and Trend of Supplies.

THE MARKETS AT A GLANCE

TWO changes of more than usual interest were the advances in range boilers and wrought iron pipe. In the instance of range boilers the 30-gallon standard size was the one to be affected primarily, although some of the large sizes also showed slightly increased prices. Wrought iron pipe advanced $2 per ton and this applies to all sizes.

The action of the United States Government in prohibiting the manufacture of all steel products for export except under license is likely to have far-reaching effects on industry in Canada. Manufacturers of wrought pipe are likely to be seriously affected. It is understood the order has been modified with respect to black and galvanized sheets. Steel commodities will be allowed to come forward to Canada only subject to a permit. In the instance of black sheets and galvanized sheets sanction of the authorities at Ottawa must be secured before sale is permitted in this country. In other words, it is the apparent intention that these commodities shall be used only in such work that is likely to further the war activities of the two countries.

One Canadian manufacturer asserted that the gauntlet to be run in securing a permit through the authorities at Washington has a tendency to discourage any attempts to bring commodities through. From present indications it would seem that wrought pipe is likely to be available only in constantly dwindling supply.

Severe weather conditions have greatly hampered trade within the past two weeks. Closing of plants by order of the Fuel Controller will tend still further to interfere with shipments. There has been considerable activity in repair work during the past two weeks, following the numerous breaks in water pipes, radiators and freezing of water mains. In one town in Ontario more than half the dwellings were cut off from a water supply through the freezing of water pipes. Ingot metals held in steady position. Weather conditions have been opposed to developing of booking trade in plumbing supplies.

TORONTO, Feb. 13.—While it is somewhat early yet for manufacturers and supply houses to get a line on the possible trend of building operations in Canada, the opinion is expressed in some well-informed circles that there would seem to be good prospects for building of apartment houses and moderate priced dwellings. Accretion in population in many industrial centres as a result of the war-time activities is given as the basis for such belief. Confidence is expressed that the building operations in Canada will be fully equal to those of last year. Severe winter weather has been against the developing of sentiment for building.

Standard 30-Gallon Boilers Advance $1

RANGE BOILERS.—An advance of $1 was made effective on the 30-gallon standard range boiler, which now makes the selling price to the dealers $14 each. For the extra heavy 30-gallon size the price remains unchanged at $17 each. Prices on 35-gallon, 40-gallon, and 52-gallon hold unchanged. Some of the larger sizes have been increased in price to the extent of approximately 10 per cent. Following are prices on some of large sizes: 66-gallon, standard $37, extra heavy $42; 82-gallon, standard $45. extra heavy $50; 100-gallon, standard $62, extra heavy $70. Increase in manufacturing costs is given as the reason for the increase in price. Following are the prices now prevailing on various sizes.

	Standard	Extra Heavy
30-gallon range boilers....	$14.00	$17.00
35-gallon	17.00	20.50
40-gallon	20.50	24.00
52-gallon	28.00	32.00
66-gallon	37.00	42.00
82-gallon	45.00	50.00
100-gallon	62.00	70.00

Closing Order Affects Manufacturers

ENAMELWARE.—Manufacturers of enamelware have been affected by the closing order in the interests of fuel conservation, but have accepted the ruling in the spirit in which it was made. Cessation of activities has had the tendency to slow business up all along the line. Price quotations held unchanged during the week.

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Sinks, roll rim, 18 x 30 in., staple.....	16 80
Closets, oak tank and seat	22 00
Do., enamel iron or white vitro tank...	23 75

Prices Hold On Nipples And Couplings

SOIL PIPE, FITTINGS.—Although there has been a change in wrought iron pipe during the week, the quotations on nipples and couplings hold unchanged. Nipples up to 4 in. are quoted at 45 per cent. off list, and couplings up to 4 in are quoted at 35 per cent. off list. Prices on soil pipe and fittings and malleable fittings remain unchanged. Demand for these commodities is seasonably light.

SOIL PIPE FITTINGS.

Medium and extra heavy soil pipe, 6-inch and under	35%	2½%
8-inch soil pipe	....	30%
Medium and extra heavy fittings, and under	40%	2½%

C. I. PIPE FITTINGS.

Cast iron fittings	....	15%
Cast elbows, tees, etc.	....	15%
Plugs	25%	
Bushings	30%	33%
Flange unions, standard	....	20%
Dart unions, ¼-inch to 2-inch.....	20%	25%
Do., 4½ in. and larger	....	15%
Nipples, up to 4-inch	....	45%
Do., 4½-inch and larger	....	40%
Do., running thread 4-in. and under	....	25%
Couplings, 4-in. and under	....	35%
Do., 4½ in. and larger	....	15%

MALLEABLE FITTINGS.

	Black	Galv.
Malleable Fittings, Class A, lb.....	0 50	0 63
Do., Class B, lb. net.....	0 22	0 33
Do., Class C, lb. net.....	0 15	0 22

Oakum Demand Still In Offing

OAKUM.—There is general expectancy on the part of dealers in oakum that marine grades will be in excellent demand with the increase in shipbuilding activities this spring. Inquiry has so far indicated this trade, but the actual demand is still in the offing. Prices on all grades, including plumbers' spun, hold unchanged from those of recent quotation.

		Per 100 lbs.
Best American	....	$21.50
U.S. Navy unspun	....	20.75
Plumbers' spun	$8.50	10.00

Steady Valve Trade Maintained

VALVES.—A steady trade in valves is being maintained in spite of the adverse conditions in transportation which is affecting delivery of goods and raw

materials. Prices were unchanged during the week.

	Discount off list
Ground work	50
Compression work, standard	52
High grade	45
Cushion work	46
Fuller work, standard	50
High grade	43
Basin cocks, No. 0 standard	46
Nos. 1 and 2	46
Bath cocks	53
Flatway stop and waste cocks, standard.	53
High grade	50
Roundway stop and waste cocks, standard	53
High grade	50
Brass steam cocks, standard	Net
Globe, angle and check valves, standard.	10
Do., removable seat	7½
Radiator valves, standard	15
Do., removable seat	10
Patent quick opening valves	35
Basin Cocks—	
No. 0 and 1, Fuller pattern	50
No. 0 and 1, compression	46
Midget	50
Globe, angle and check valves, medium pressure	30
Radiator valves, standard	30
Radiator valves, Jenkins disc	30
Radiator valves, quick opening	40

Wrought Pipe Advances $2 Ton

WROUGHT PIPE.—An advance of two points in the price of wrought iron pipe has been made effective, which increases the cost by $2 per ton. Manufacturers face the future with an element of doubt owing to the acute situation brought about by prohibition of manufacture of all steel products in United States except under license. This will mean that supplies of skelp can only be brought into Canada under permit. The interminable delays and difficulties attending the issuance of permits puts manufacturers in a frame of mind which makes them almost ready to forego application for same. There is every indication that supplies of pipe will be in still smaller compass in the not distant future. Even at the present time manufacture can only be carried on intermittently by reason of delays in arrival of raw materials. This condition will probably grow worse rather than better.

WROUGHT IRON PIPE

Effective Feb. 5, 1918.

Prices withdrawn pending new prices.

Standard Buttweld—	Per 100 feet Black	Galvanized
⅛ in.	$ 6 00	$ 8 00
¼ in.	5 16	7 29
⅜ in.	5 16	7 29
½ in.	6 55	8 12
¾ in.	8 28	10 41
1 in.	12 24	15 39
1¼ in.	16 56	20 82
1½ in.	19 80	24 89
2 in.	26 64	33 49
2½ in.	42 71	53 53
3 in.	55 85	70 00
3½ in.	70 84	87 76
4 in.	83 93	104 10
Standard Lapweld—		
2 in.	29 60	36 08
2½ in.	44 46	54 70
3 in.	58 14	71 53
3½ in.	72 68	90 62
4 in.	86 11	107 37
4½ in.	97 79	122 56
5 in.	114 00	142 82
6 in.	147 80	185 28
7 in.	192 80	241 57
8 L in.	202 50	253 75
8 in.	233 30	292 32
9 in.	279 50	350 18
10 L in.	259 20	324 80
10 in.	333 70	418 18

Terms 2% 30 days, approved credit.
Prices—Ontario, Quebec and Maritime Provinces.

Black Sheets Have Been Made Exception

SHEETS, PLATES.—A recent regulation by the United States Government forbids producers to roll or manufacture sheet metal products for export except under license. This regulation applied previously to No. 10 gauge and heavier, but by the new regulation all gauges of black and galvanized sheets were affected. Furthermore, any stocks that are permitted to come through to Canada as a result of the export license granted by the United States Government cannot be sold in Canada until the importer has obtained permit from the Dominion Government. But a change has come in the original situation in that the original order has been modified to permit of black sheets being rolled without necessity of license. However, dealers in Canada are not sure that the matter has been disposed of finally, and until this takes place an uncertainty will prevail in the market.

BLACK SHEETS—	Per 100 lbs.	
10 gauge	$	$10 00	$12 00
12 gauge	7 55	10 10	11 60
14 gauge	7 45	8 40	9 10
16 gauge	7 50	8 50	9 20
18-20 gauge	7 30	8 05	8 30
22-24 gauge	7 35	8 10	8 35
26 gauge	7 40	8 15	8 40
28 gauge	7 50	8 25	8 50
3-16-inch plate	10 25	....	....
¼-inch boiler plate	10 00	....	....
GALVANIZED SHEETS—			
10¾ oz.		$9 50	$10 50
U.S. 28		9 20	10 20
U.S. 26		8 90	9 90
22 and 24		8 75	9 75
18 and 20		8 60	9 60
16		8 45	9 45
14		8 35	9 35

Corrugated Sheet Prices Maintained

CORRUGATED SHEETS.—The situation as outlined above with respect to black and galvanized sheets will have a bearing on the market for corrugated sheets. With a restriction in the amount of galvanized sheets available there is pretty sure to be a firm situation in the manufactured article. Demand is somewhat light at this season of the year.

TORONTO—	Galvanized Per 100 Sq. Feet	Painted Per 100 Sq. Feet
No. 28 gauge	$ 8 25-$ 8 75	$6 75-$7 25
No. 26 gauge	9 00- 9 50	7 75- 8 25
No. 24 gauge	13 00-	10 50
No. 22 gauge	16 00-	13 25
No. 20 gauge	19 00-	16 50
No. 18 gauge	23 00-	20 00

Discount 7½%.

No Improvement In Tube Situation

BOILER TUBES.—Strict regulation of the sale of boiler tubes for domestic use still continues. Permits must first be secured to export from the United States, and when stocks arrive in this country permits must then be obtained from the Dominion Government to sell them in Canada. A tight rein is being kept on this commodity by the Governments of the two countries.

Toronto—	Per 100 feet Cold drawn	Lapweld
1 inch	$36 00	$ ....
1¼ inch	40 00	....
1½ inch	43 00	36 00
1¾ inch	43 00	36 00
2 inch	50 00	36 00
2¼ inch	53 00	38 50
2½ inch	55 00	42 00
3 inch	64 00	50 00
3¼ inch	....	58 00
3½ inch	77 00	60 00
4 inch	90 00	75 00

Prices of Lead and Zinc Products Hold Steady

LEAD AND ZINC PRODUCTS.—Prices were unchanged in lead and zinc products during the week. Demand is somewhat light, which is characteristic of this season of the year. In the primary market pig lead was in slightly firmer undertone during the week, although sales were made ¼c down.

Lead pipe, lb.	$ 0 14	$ ....
Lead waste pipe, lb.	0 15	....
Lead traps and bends	Net list	
Lead wool, lb.		0 16
Lead sheets, 3 to 3½ lbs. sq. ft., lb.		0 13¼
Lead sheets, 4 to 8 lbs. sq. ft.		0 12½
Cut sheets, ¾c lb. extra, and cut sheets to size, 1c lb. extra.		
Solder, guaranteed, lb.	0 44½	0 45
Solder, strictly, lb.	0 41	0 43
Solder, commercial, lb.	0 37½	0 39¼
Solder, wiping, lb.	0 38	0 40½
Solder, wire, lb.	0 42½	0 46
Zinc sheets, per lb.	0 26	

Heavy Lead Pipe And Scrap Zinc Higher

OLD MATERIALS.—There was a firmer tendency with the higher prices in heavy lead pipe and heavy zinc during the week. Former is quoted ½c higher in prices being paid by wholesalers, while heavy zinc is quoted firm at 6c. Heavy copper showed a firmer tendency at 21c to 21½c per pound. Country mixed scrap is quoted at $16 per ton. Movement of old materials is being hampered at present owing to snow. There has been a fair demand from consumers. All lines of old materials held steady in price.

Tea lead	$ 0 04½	....
Heavy lead pipe	0 07	....
Yellow brass	0 12	0 13
Red brass	0 20	....
Light brass	0 09	....
Heavy zinc	0 06	0 06
Heavy copper	0 21	0 21½
Stove plate, per ton	17 00	18 00
Old rubber boots and shoes	0 08¼	....
Old cast iron, per ton	23 50	25 00

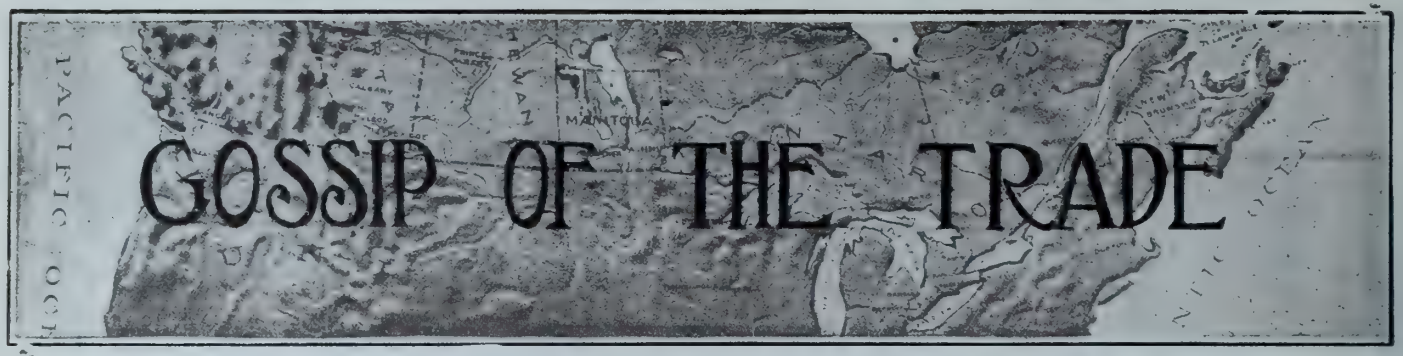
Tin Continues Most Active Of Metals

INGOT METALS.—Tin continued to be the most active of the ingot metals during the week. There is a better demand for spelter in local market. Trade in copper has settled into routine business.

COPPER.—There was a steadiness in the market for copper in view of the established price which is to rule until June 1. There is a heavy consumption of copper on this continent and for the export business, but there is every indication that production will keep pace. In the local market business was not heavy and prices held unchanged at 30c to 32c for casting copper.

TIN.—The market for tin locally continues in a strong position. There is a good demand and prices were firmly maintained at 78c to 80c per pound. In the United States market further commandeering of supplies has been going on, stocks on two steamers having been

(Continued on page 30.)



TRADE NOTES

Montreal, Que.—Twizell & Hutton, sanitary engineers, have dissolved partnership.

PERSONAL

Woodstock, N.B.—Joseph Fewer, member of the firm of Fewer Bros., sanitary engineers, is entering his fourth year as a member of the Town Council. Councillor Fewer presided over the sewers department and other departments during the past year.

Herbert Jay, an employee of Bennett and Wright Company, Toronto, recently suffered severe burns when his clothing was set on fire by a gasoline torch which he was carrying up a ladder. He was ascending the ladder when his clothing became ignited. Dropping the torch he raced for the roof of the building where he arrived a mass of flames. Fellow-workmen quickly stripped his blazing clothing but not before he had sustained severe burns.

OBITUARY

Mr. T. F. Sinclair, of Vancouver, a well-known contractor, passed away recently at his home in that city. The New Westminister water works plant is one undertaking which was carried out by Mr. Sinclair.

WORKS CONTEMPLATED

Marysville, N.B.—The construction of sewers costing $5,000 is contemplated by the town council.

North Vancouver, B.C.—City Council contemplate construction of a number of sewers, including 8th and 10th Streets, from Lonsdale Avenue to Ridgeway Avenue.

Brandon, Man.—The City Council has been requested by the Province of Manitoba to submit proposals for supplying water to the Hospital for the Insane. The preliminary estimate of the cost of the extension to the main pipe is $15,000. The installation of additional pumping engines will be required also.

London, Ont.—Board of governors contemplate installation of heating system in the Western University. President, Dr. E. E. Braithwaite.

Port Moody, B.C.—The City Council is contemplating dam construction to insure a sufficient water reserve. City engineer, J. H. Kilmer.

Penticton, B.C.—The City Council contemplate improvements to the water system to cost $20,000, and to the irrigation system to cost $35,000.

CONTRACTS AWARDED

Montreal, Que.—Alphonse Gratton, 142 Fifth Avenue, Maisonneuve, has the general contract for sewerage system for the City Council.

West Zorra Township, Ont.—Contracts have been awarded for the construction of 2,700 feet of tile drain for the Township Council.

Hamilton, Ont.—J. D. Armstrong awarded contract for constructing sewers on McNulty Blvd. and Beach Road at $3,000.

York Township, Ont.—General contract for water main on Buttonwood Avenue for the Township Council has been let to Mitchell & Mohan, London, Ont.

St. Anne de Bellevue, Que.—W. G. Edge, Ltd., Booth Bldg., Ottawa, have the plumbing and heating contract for military hospital for the Military Hospitals Commission.

Chatham, Ont.—Purdy, Mansell Ltd., 63 Albert Street, Toronto, have the heating contract for $40 000 bank for the Canadian Bank of Commerce, 23 King St. W., Toronto.

C. G. Anderson.Kenora, has the contract for gat house and intake at Waugh for the Greater Winnipeg Water District, 501 Tribune Bldg.

Brantford, Ont.—T. J. Minnes & Co., 9 King Street, have the plumbin contract in connection with the erection of the $132,000 extension to plant of the Dominion Steel Products Ltd., Morrell Street.

Brantford, Ont.—Chas. Taylor & Co., 12 Dalhousie St., have the plumbing contract for $9.000 addition to munition factory for the Steel Co. of Canada, Ltd., West Brantford.

Winnipeg, Man.—The Canada Lock Joint Pipe Co. have the contract for the supply of concrete pipe and the jointing work for the Greater Winnipeg Water District, 501 Tribune Building.

Winnipeg, Man.—Thos. Kelley and Sons, 504-5 Lindsay Building, have the contract for tunnel for the Great Winnipeg Water District.

Montreal, Que.—L. E. Moulton & Co., Ltd., 142 Inspector St., have heating contract in connection with the erection of a $25,000 addition to factory for A. R. Whittall Can Co., Ltd.

CONSTRUCTION

Ottawa, Ont.—The Department of Public Works, Dominion Government, contemplate the erection of a $1,500,000 office building.

St. John, N.B.—The Great War Veteran's Association contemplate the erection of a $50,000 soldier's home.

Sydney, N.S.—Falconer & McDonald, Ltd., Davidson Street, Halifax, have the general contract for $40,000 church for the Union Baptist Congregation.

Vancouver, B.C.—Baynes & Horie, 836 Howe St., have the general contract for $35,000 building for the McGill University.

South Vancouver. B.C.—The erection of a $500,000 rope and twine factory is contemplated.

St. Anne de la Pocatiere, Que.—Jos. St. Hilaire, St. Rofuald, has the general contract for $135,000 church.

Province of Alberta.—The Department of Public Works will build a male dormitory for the Ponoka institution to cost $100,000.

Smithers, B.C.—The Grand Trunk Pacific Railway, head office, Montreal, contemplate the erection of an $18,000 station this Spring.

Parry Sound, Ont.—At a cosa of $25,000, W. F. Thompson will rebuild his hotel which was recently destroyed by fire.

Amherstburg, Ont.—Town Council intends to have an engineer make an esti the water system.

Brandon, Man.—City Council has decided to install new pumps to cost $30,000 at the waterworks.

Essex County, Ont.—By-law will be submitted on March 30th re temporary sewerage for Windsor, Walkerville, Ford, Sandwich, Ojibway, and Sandwich West to cost $210,000.

Galt, Ont.—The Board of Health has ordered all property owners on Ainslee and Dickenson Streets to close outside closets and connect with the sewer by August 1st.

Quebec, P.Q.—The Quebec City bill now before the provincial legislature prodives for $50.000 for permanent works for the waterworks department, $10,000 for improvements and additions to the fire brigade service and apparatus.

Sandwich, Ont.—The new 12-inch water main across the London St. bridge will be completed shortly. It is suggested that Sandwich have an engineer test the piping system.

Geulph, Ont.—City Engineer McArthur recently consulted with Provincial Sanitary Engineer Dallyn in connection with the difficulty at the local sewage disposal works.

Niagara Falls, Ont.—The Hydro-Electric Power Commission and the city council are working on plans for a new source of water supply for Niagara Falls. City engineer, W. C. Jepson.

"P. & H."

The following is taken from the Toronto "Telegram," January 19th issue:

"P. & H., 45c per hour," was the item recorded in bills receivable by Toronto people who invited the plumber and helper to visit their homes and thaw out the water pipes in the winters of long ago.

"P. & H., 85c per hour," is the entry that supplies a tragic sequel to the presence of plumber and helper in the Toronto homes of 1918.

Once the claims of "P. & H." could be liquidated by the drippings from a small leak in the householder's pocketbook. To-day the charges of "P. & H." can only be extinguished by a cloudburst of cash.

If the writer of the above only inquired more into the wages paid by employers to journeymen and helpers in the plumbing trade there would be a different story to tell. He would find that most journeymen are being paid from 50c to 60c per hour, and helpers are receiving anywhere from 20c to 30c per hour, and not a cent too much these days. How is it possible to pay honest business obligations out of the difference between what is paid by the employer and what he receives from his customer?

OFF AGAIN, ON AGAIN

The Board of Control, Toronto, recently decided to ask the Canadian National Exhibition Board to hand over to Finance Commissioner Bradshaw a cheque for $42,500. This amount is made up of $35,000 which the board held back to erect new lavatories at the grounds, and $7,500 voted to the widow of the late Dr. Orr.

This is two or three times that the Toronto City Council or Board of Control have changed their decisions regarding the providing of a public comfort station in the Exhibition grounds. What's the matter with the Board of Health? Why cannot a sanitary engineer be appointed on the Board of Health who will plan ways and means to provide adequate and sanitary conveniences throughout the city? For a matter of $35,000 the City of Toronto is going to be ridiculed again this year for the insanitary arrangements that are provided at the Exhibition grounds.

WATER FAMINE IN LONDON

During the recent cold weather citizens of London, Ont., allowed their taps and faucets to remain open in the hope that the running water might prevent the pipes from freezing. As a result there was a great wastage, and though pumping 6,000,000 gallons a day the system could not keep pace. A number of street mains in the city burst with frost and the municipal reservoirs lost thousands of gallons. The result was that the water was turned off in London for an afternoon and a night with slight relief at supper time.

DIVISION OF PLUMBING AND DRAINAGE.

Nov., 1917.

Inspections.

		Comparison with Nov., 1916. Increase.	Decrease.
Inspections requested	1,080	....	6.3%
Inspections made:			
Plumbing	822		
Drainage	488		
Smoke test	185		
Total	1,495		
Letters	448		
Notices	1,360		
Total	1,808	4.2%	

Registration of Plumbers

Under Police Commissioner's By-law No. 90.

Plumbers registered		1
Certificates issued		3
Board meetings		2
Candidates examined		5

Police Court Proceedings.

Cases in Court Nov. 1st, 1917	10	
Summons issued	20	
		30
Cases withdrawn from Court	19	
Cases in Court Nov. 30th, 1917	7	
		26

Industrial Hygiene.

Unsatisfactory Conditions Found:	
Defective plumbing	29
Defective ventilation	12
Filthy workrooms and lavatories	30
Conditions improved on re-inspection, after notices served, as follows:	
New lavatories	17
New water closets	63
New basins and sinks	106
New urinals	18
New drinking bubblers	20
Sanitary drinking cups and individual glasses	5
Exhaust fans and blowers	11
Ventilation improved	2
Drains and plumbing repairs	11

The above tables show the nature of the work executed by the Toronto Division of Plumbing and Drainage. It is often said by those who do not realize the importance of such work that "we are inspected to death." What would be the results if such work as described above was ignored altogether, or even only half done?

TO UTILIZE OLD TIN CANS

Application has been made to the Board of Control, Winnipeg, for a four years' franchise to utilize the old tin cans accumulated in the city dumps. The project contemplates the separation of the solder, tin and iron in the cans, and the melting of the last-mentioned into bars.

LITTLE Tobin: "Mamma, didn't you say we should always try to make other people happy?"

Mamma: "Yes, dear."

Little Tobin: "Well, I know a little boy that I could make very happy if I had five cents to buy candy with."

Mamma: "Who is the little boy?"

Little Tobin: "It's me."

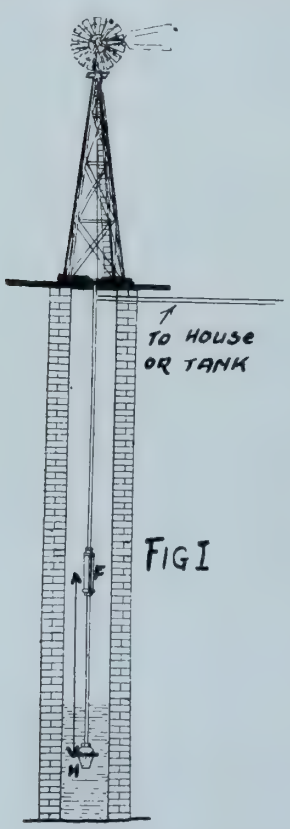


Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

YOU ARE WRONG, MR. EDITOR

Editor Sanitary Engineer,—I was more than ordinarily interested in your article on page 27 in the Jan. 15 issue entitled "Windmills as a power." It contained some very useful information, but you made one rather serious mistake on page 28 about the middle of the centre column where you say:

"There are two types of windmill; one is simply a pumping mill and the other may better be designated a wind engine. The first kind will lift water approximately 25 feet or so and fitted on lightly built towers, the whole pumping head only weighing probably



50 lbs. These are equipped with a wheel generally about 8 feet in diameter having 18 vanes each."

The fact is, Mr. Editor, that I personally know of scores of "pumping mills" with 8 foot wheels that are supplying water from a depth of more than 150 feet. Then you refer to the weight of such mills as being about 50 lbs. These mill outfits, I am sure, weigh more like 500 lbs.—G. A. S.

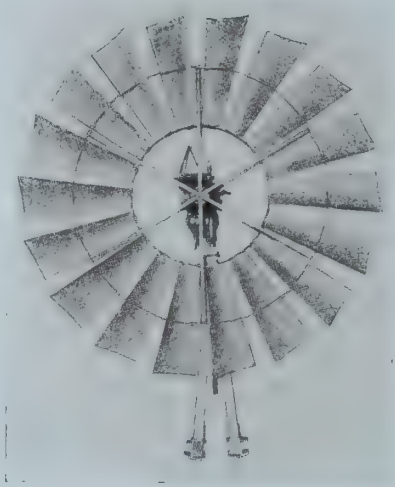


Fig. 3.

In the first place we must accept our reader's criticism as being no doubt very constructive, because it is quite possible that more of our readers would come to the same conclusion.

Regarding the weight of the mill outfit, this was a typographical error. It should have read 500 lbs.

Next, regarding the statement that the pumping mill will lift water approximately 25 feet, we are in actual fact correct. No pumping appliance will lift more than 25 feet and keep up continuously doing so, at least such a type of pump as is attached to the ordinary pumping mill or even such a class as is regularly installed for domestic purposes.

We should however, explain what is meant by lifting. See accompanying illustration. Fig. 1.

When a pump is said to lift water 25 feet it means that the pump cylinder at F must not be more than 25 feet from the lowest level of the water on the well, that is that when the level of the water is liable to lower as a result of pumping water out, the lowest level should not be more than 25 feet from the cylinder. For example, in the case of Fig. 1, the distance between the foot value H and the cylinder F is not more than 25 feet so that this installation could be relied upon to lift all the water out of the well, but if the cylinder F was say 30 feet from the level of the water it would not lift the water for any



length of time. It may for a while.

Now, regarding our reader's statement that he knows of pumping mills that are

(Continued on page 30.)



MUELLER

Globe and Angle Valves

BUILT from actual, practical experience. Made of the famous **MUELLER** steam metal and fully guaranteed against all defect in design and construction. Not a Valve, but *the* Valve.

¶ **MUELLER** globe and angle Valves can be repacked under pressure. The disc is so designed as to adjust itself to any position and still receive the thrust of the spindle on the center line; thus preventing any distortion to the seat or diaphragm. The pipe threads are full length, and are tapered to conform to I. P. Threads, insuring perfect joints.

¶ Full sized and unobstructed passages guarantee full service. The large Hexagons allow an excellent wrench grip and our design puts the strain where it belongs, so that there is no danger of distorting either the body or the bonnet. Furnished with enameled, Malleable iron wheel handles. Every **MUELLER** Valve tested to beyond unusual service conditions. Write for prices.

MUELLER gate and check valves, steam cocks, etc. rank highest in every branch of exacting service.

H. Mueller Mfg. Co., Limited

SARNIA, CANADA

QUESTION BOX

(Continued from page 28)

supplying water from a greater depth than 150 feet, that may be so, that too is quite possible providing the pump cylinder is lowered into the water. The distance between the cylinder F and the supply pipe to house may be almost any distance, in a vertical line. But it must be borne in mind that any water which is in any pipe that is fitted to the top of a cylinder is in a practical sense being forced to a location, tank or reservoir.

It will therefore be seen that a pumping mill may have its cylinder situated, say, any distance within 25 feet from the lower level of water, and will lift this water 25 feet, then having lifted it, the power above the cylinder will force the water almost any distance, according to the strength of the mechanism of the mill, or as we have termed such appliance, an "air motor."

So that it will be noted that our reader is both right and wrong. He is right when he says that "he knows of scores of pumping mills that are supplying water from a depth of more than 150 feet." Certainly they will "supply," but in the supplying they are really "lifting" say 25 feet of the distance and "forcing" 125 feet. In supplying water to a higher elevation than the top of a cylinder, there are two operations, "lifting and forcing."

While discussing this "pumping mill" question, it might not be out of place to point out to our readers that many a pumping mill has been condemned for no fault of its own. For example, suppose that a pumping mill was not delivering the water that the owner feels it should, he is very apt to blame the "mill" when the fault lays with the cylinder and vales, etc.

The writer has seen many a "mill" standing idle, and when making inquiries about it, has been informed that "the mill was no good, it would not pump enough water for a chicken," etc., etc. Time and again the writer has made repairs to the cylinders and cleared the pipe lines, sometimes found the suction line leaking air between the cylinder and foot vale, or even found the screen over the foot vale clogged up. So that in a pumping mill there are two distinct pieces of machinery. The "mill," which is the motive power and the pump, or the apparatus to be operated by the motive power.—Editor.

MARKET CONDITONS

(Continued from page 25)

taken in charge before they had a chance to reach warehouses.

SPELTER.—There was more interest in buying of spelter in the local market during the week, and prices were held steady at 9¾c to 10½c per pound.

LEAD.—The firm undertone to lead continued to be manifest in the primary market and the condition was reflected in the local market by an advance of ¼c per pound with some of the large dealers. Quotations are now made on the basis of 9¼c to 9½c per pound. Demand is light.

ANTIMONY.—The market is quiet, with quotations unchanged at 16c to 18c per pound. Primary situation is one of steady firmness. Demand in the local market is not heavy.

ALUMINUM.—Quotations for aluminum were unchanged at 60c per pound. The demand is steady, with little keenness manifest.

PIG IRON.—Transportation problems continue to be the big factor with the producers of pig iron. There is a fair demand, but deliveries are greatly hampered through inability of railways to cope with storm and severe weather conditions. Quotations were unchanged at $49.50 per ton for foundry iron.





"Exactly what I am after"—that's what thousands of sanitary engineers in Canada and the United States have said. Desolvo is the greatest time-saver ever put on the market for clearing choked waste pipes and thawing out frozen drains.

Drop a line on your letterhead and we will send you a trial can absolutely FREE.

Chamberlain Desolvo Co., Limited, Toronto

Stevenson Building, Church St., Toronto. GENERAL OFFICES, PITTSBURGH, PA.



The best advertising you can get is to satisfy your customers and the most exacting customer will be thoroughly pleased with the quiet operation of the

TRADE SILENTFILL MARK

NO NOISE.

MANUFACTURED BY

CALLOW & PHILLIPS

40-42 Lombard St., Toronto, Can.

Telephone Main 2016

LONDON WATERWORKS EXTENSION

The utilities commission of London, Ont., has shown in its statement of proposed expenditures for 1918, a sum of $65,000 for waterworks extension.

ENGINEERING AND TECHNICAL INSTITUTE FOR B.C.

An association known as the Engineering and Technical Institute of British Columbia is making application for incorporoation, to the Legislative Assembly of British Columbia. Its avowed objects are, "to promote and increase the knowledge, skill and proficiency of its members in all things relating to the architectural, engineering surveying and technical profession and to establish and conduct examinations and prescribe such tests of competency and moral character as may be thought expedient and to grant certificates of membership to those approved of, and to purchase or otherwise acquire and hold real and personal property for the purpose of the institute." etc.

CONDENSED ADVERTISEMENTS

FOR SALE—200 ODD LENGTHS OF ⅜" AND ½" pipes, threaded at both ends, ranging from 4 feet to 11 feet in length. Pipes are free from rust and in perfectly good order. Stauntons Limited, 944 Yonge St., Toronto.

FOR SALE—SEVERAL ¾" AND ½" ASSORTED tees and elbows; 200 nipples from 4" to 15" long. Stauntons Limited, 944 Yonge Street, Toronto.



Make A Real Smoke Test

AND BE SURE OF YOUR JOB

You can only do so when you

Use THE "THOMSON" SMOKE MACHINE

By its use every leak can be quickly detected and rectified. Saving time and trouble all along the line. This testing machine is the most practical and scientific device of its kind. It is approved by every scientific sanitary engineer on this Continent, and is known from coast to coast. No shop is complete without a Thomson smoke machine. Very strongly built, yet light and portable, that can be readily carried from place to place.

Write us for prices.

There are quite a lot of sanitary engineers who make a specialty of smoke testing plumbing. It has become a recognized factor of safety. Why not procure a "Thomson" Machine and go after some.

James Morrison Brass Mfg. Co., Limited

93-97 Adelaide Street West, Toronto



HOYT METAL GOODS ARE KNOWN

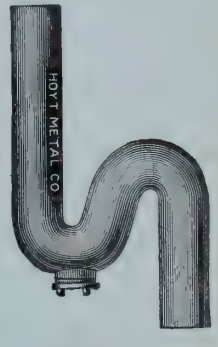
FROM COAST TO COAST



As time-savers there are none equal to our Wiping Solder Bar or Wire Solder.

Hoyt Lead Traps, bends and waste pipe are in a class by themselves.

Our Mixed Metal Sales Amount To Over $5,000,000 Annually.



Write your Jobber

HOYT METAL COMPANY, TORONTO, ONTARIO

New York, N. Y., London, Eng., St. Louis, Mo.

Write Us

Mention this paper to Sanitary Engineer Advertisers.



The President Has the Right Idea

IT was the Annual Meeting of the Weaver Knitting Company, makers of underwear and hosiery. The particular item of the balance sheet that excited the caustic comment of one shareholder was the moderate sum of $13,567.83 for advertising. "When we are so much oversold," said he, "surely it is not necessary to keep on spending money to advertise our goods." And there were some who thought as he did.

"Gentlemen," said the President, "if you figure it out, our advertising expenditure for the year is about 1%—not a very heavy sum to pay out to maintain the good name and favor which our brand enjoys. There was a time when we had to spend a good deal more than the sum in the balance sheet to get our brand into the retail stores of the country, and to induce the public to buy it. I am unwilling to cut out advertising, and I'll tell you why.

"Our men are not canvassing with the diligence they gave to the work of selling when business was harder to get. They are not calling as often as formerly, and when they go, they are not very urgent. But we would be committing suicide if we ceased to court the good-will of the retailers and to keep our brand in the public eye. We have and will have competition. We must have regard for the post-war trade. If we quit our solicitation now, we shall have to do double work later on, at a heavy cost. I am authorizing our present advertising as a form of business insurance.

"Our goods continue to be sold through the retail trade. We owe it to our retail customers to keep in solicitous touch with them—to show them that we value their co-operation and good-will, even though we cannot always fill their orders. We tell our retail friends the naked truth, and we are keeping their loyalty. If we pursued any other course, I fear we would greatly rue it in days to come.

"Our advertising latterly has put us in touch with many new accounts and prospects. Our men cannot call on as many men as they did when train schedules were better than they are to-day. We are employing advertising to lower selling costs, and if Mr. ———— will give me half an hour after this meeting, I think I can satisfy him that our advertising outlay has played a large part in putting our balance sheet in the good terms in which it appears.

"Our trade mark is worth, as an asset, a goodly sum—many scores of thousands of dollars. That value has been created and maintained by our previous advertising. But, Gentlemen, if we dropped our advertising during these war years, the certain thing is that the value of our trade mark would fall sharply, and the good-will and co-operation of the retail trade would likewise fall away. From this point of view it is good business to spend 1% or so to maintain the value of our trade mark and the asset known as good-will.

"Gentlemen," proceeded the President, "I am sorry to have taken so much time to defend our policy. Need I say more?"

UPON that, Mr.————, the objecting shareholder, rose and said: "I wish to withdraw my criticism of the item of advertising expenditure. I had not looked at the matter as our President has presented it. I feel rebuked. Also I am persuaded that the President's course has been wise, and I wish to say to him and to you all that I sincerely regret my criticism."

Among the mediums serving retailers used by the Weaver Knitting Company are:

Dry Goods Review	**Page, 12 times in the year**	**$420**
Men's Wear Review	**Page, 12 times in the year**	**360**

These are ridiculously small sums to expend to maintain retailers' good-will and co-operation, and get by-mail business.

Other mediums serving Canada's retailers and which will be of interest to other firms are:

Canadian Grocer	**Page, 52 times in year**	**$1,248**
Hardware and Metal	**Page, 52 times in year**	**1,248**
Bookseller and Stationer	**Page, 12 times in year**	**300**
Sanitary Engineer	**Page, 24 times in year**	**400**

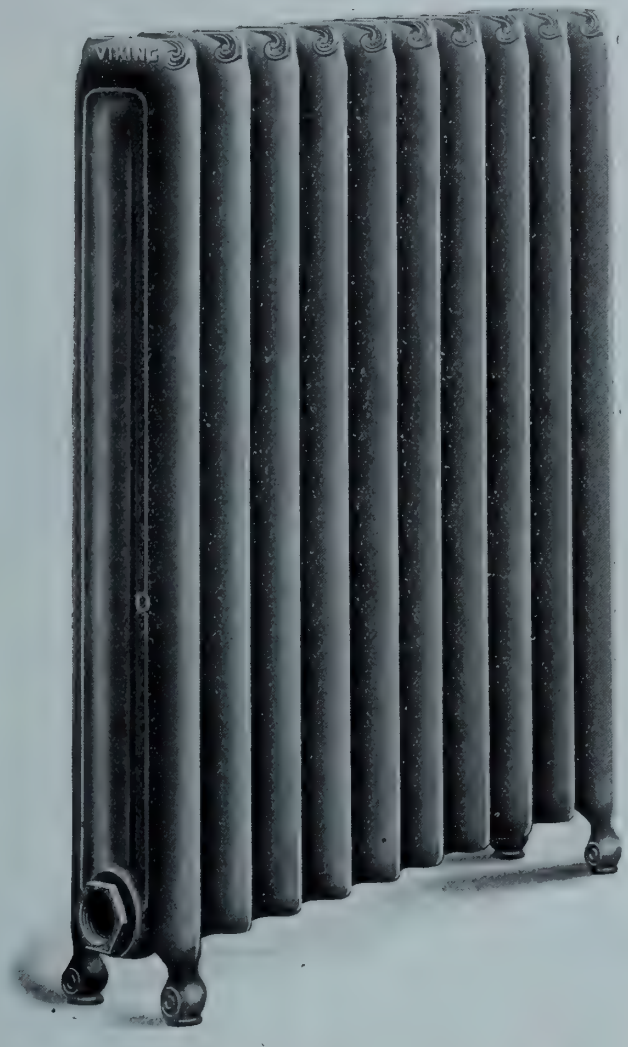
ADVERTISING to the retailer is too valuable a salesman to omit from one's organization. And the cost per annum is quite too small to be a barrier. Also there is this: Whether or not the manufacturer believes in advertising, his retailer customers and prospects do. So it is wise to fall into line with the wishes of customers—the men who call the tune, because they pay. We have hundreds of letters to prove this.

We are always glad to discuss this matter of advertising with manufacturers—not in a strong-arm way, but reasonably. If we have the right idea, it certainly becomes profitable for manufacturers to possess the same idea. We solicit correspondence from interested manufacturers.

The MacLean Publishing Company, Ltd., Toronto, Canada

Also at MONTREAL, WINNIPEG, NEW YORK, CHICAGO, BOSTON and LONDON, ENG.

Daisy Boilers and Viking Radiators Have No Equal



BACKED BY OVER 50 YEARS OF PRACTICAL EXPERIENCE

For Efficient and Economical heating, specify Daisy Hot Water Boilers and Viking Radiators and conserve the fuel for your country by this installation.

The Daisy Boiler is manufactured only by

WARDEN KING LIMITED, MONTREAL

BRANCH, 200 Adelaide St. West, TORONTO

King Boilers get up heat quickly

Very shortly after the fire is lighted in a King Boiler hot water reaches the radiators. The thin, peculiarly shaped waterways in the "King" mean quickly heated water and perfect circulation. The perfect circulation causes a saving in fuel because it obviates the necessity of "extra firing" to move cold water from the radiators.



The Trade should use this quick-heating, fuel-saving argument now while fuel is scarce and high in price.

WRITE US FOR PRICES

Steel and Radiation, Limited

Head Office, FRASER AVENUE, TORONTO

304 University Street, MONTREAL **101 St. John Street, QUEBEC**

AGENCIES IN ALL LEADING CITIES

Joseph Breeden & Co., Ltd.

NEW MILL WORKS

Fazeley Street, Birmingham, England



MANUFACTURERS OF

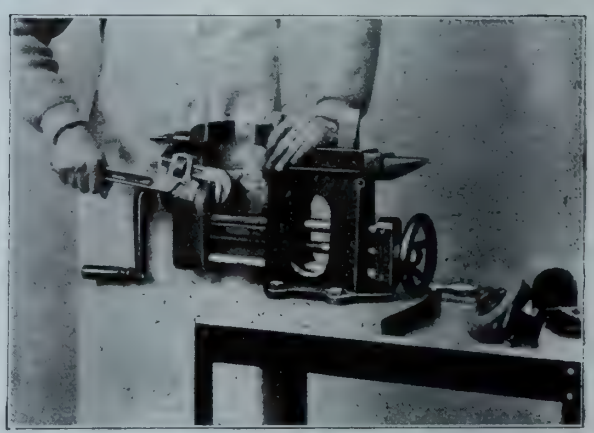
HIGH CLASS

Steam and Water Fittings

THE

Stewart Handy Worker

An Equipment All in One



WEIGHS 90 POUNDS

The Equipment Comprises——

A Pipe Vise
A Bench Vise
A Bench Grinder
A Two-Speed Drill
A Hardy Cutter
An Anvil

It's not a toy. It's a real combination of practical tools for practical people.

Write for full particulars.

CHICAGO FLEXIBLE SHAFT COMPANY

12th Street and Central Avenue

Department H.W. **CHICAGO, U. S. A.**

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Thousands of Shrewd Fitters Have Discovered a NEW WAY to Make MORE MONEY!

THEY used to tear down a leaky or cracked boiler—waste time—perhaps wait a week or more for new sections—keep the customer in the cold—send a big bill—and **at that** not make very much profit!

Now—they simply pour "X" Liquid into the boiler. No welding—no dismantling—nothing to take apart. In 30 MINUTES THE JOB IS DONE! The cost is from $6 to $10. They get a GOOD price for the job—and **the customer** is perfectly satisfied. **"X" Liquid enables these fitters to do more work every day.**

"X" IS A PURE LIQUID. It is poured into the boiler and combines with the water. In sizzling out through the leak or crack the "X" is changed instantly into a solid, making a **permanent repair.** You don't have to know where the trouble is. "X" finds the leak or crack—and repairs it automatically.

The surplus "X" that remains in the water **prevents rust and scale.** "X" is not a cement or powder. Cannot clog air valves.

YOU OWE IT TO YOURSELF TO TRY "X." YOU CAN'T LOSE. "X" IS GUARANTEED TO WORK OR YOUR MONEY WILL BE RETURNED.

"X" *The Wonderful* BOILER LIQUID

$6 WORTH WILL DO A $100 REPAIR JOB IN 30 MINUTES.

"X" LIQUID IS USED BY

Pierce, Butler & Pierce, U.S. Radiator, Richardson & Boynton, Federal Radiator Co., General Electric Company, U.S. Government, National Radiator Co., Standard Sanitary Co., Crane Co., Gurney Heater Co., and many thousands of progressive steamfitters.

Your jobber will order it for you—or we will ship direct. Write for trade discounts—NOW!

"X" Laboratories

636 Washington St. - BOSTON, MASS.

Classified Buyers Guide

Occasionally advertisements are inserted in the paper after this page has gone to press. The insertion of the Advertiser's name on this page is not part of the advertising order, but is inserted solely for the convenience of the reader of the paper

Air Line Systems.
C. A. Dunham Co., Ltd., Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Air Valves.
Beaton & Cadwell Mfg. Co., New Britain, Conn.,
Beaton & Corbin Mfg. Co., Southington, Conn.
Canadian Wolverine Co., Ltd., Chatham.
C. A. Dunham Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London, Ont.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.

Asbestos Goods.
James Morrison Brass Mfg. Co., Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Boilers, Steam or Hot Water.
Lord & Burnham Co., Ltd., Toronto.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.

Boiler Feed Regulators.
C. A. Dunham Co., Ltd., Toronto.
James Morrison Brass Mfg. Co., Toronto.

Brass Goods, Valves, etc.
Joseph Breeden & Co., Ltd., Birmingham, England.
Canadian Brass Co., Ltd., Galt, Ont.
Canadian Wolverine Co., Ltd., Chatham.
C. A. Dunham Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London, Ont.
Galt Brass Co., Limited, Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
Kerr Engine Co., Ltd., Walkerville.
H. Mueller Mfg. Co., Ltd. Sarnia, Ont.
Puro Sanitary Drinking Fountain Co., Toronto.
L. Wolff Manufacturing Co., Chicago.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Brass Pipe and Tube.
Canada Metal Co., Ltd., Toronto
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London, Ont.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Cellar Drainers.
Galt Brass Co., Limited, Galt.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

Chain Wrenches.
Trimont Mfg. Co., Roxbury, Mass.

Closets.
Canadian Brass Co., Ltd., Galt, Ont.
Canada Metal Co., Ltd., Toronto.
Cluff Mfg. Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., Ont.
Galt Brass Mfg. Co., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Standard Sanitary Mfg. Co., Ltd., Toronto.
L. Wolff Manufacturing Co., Chicago.

Country Residence Equipments.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Ontario Wind Engine & Pump Co., Ltd., Toronto

Damper Regulators.
C. A. Dunham Co., Ltd., Toronto.

Drainage Fittings.
Canada Metal Co., Ltd., Toronto.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.

Drinking Fountains.
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London, Ont.
Puro Sanitary Drinking Fountain Co., Toronto.

Ejectors, Steam.
James Morrison Brass Mfg. Co., Ltd., Toronto.
Kerr Engine Co., Walkerville.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Enamelware.
Amherst Foundry Co., Ltd., Amherst, N.S.
Canada Metal Co., Ltd., Toronto.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Standard Sanitary Mfg. Co., Ltd., Toronto.
Port Hope Sanitary Mfg. Co., Ltd., Port Hope.
L. Wolff Manufacturing Co., Chicago.

Electric Pumping Machinery.
Empire Mfg. Co., Ltd., London, Ont.
Ontario Wind Engine & Pump Co., Ltd., Toronto.

Fittings.
Canada Metal Co., Ltd., Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Flushometers.
Canadian Brass Co., Ltd., Galt, Ont.
Canada Metal Co., Ltd., Toronto.
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London, Ont.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Standard Sanitary Mfg. Co., Ltd., Toronto.
L. Wolff Manufacturing Co., Chicago.

Floor and Ceiling Plates.
Beaton & Cadwell Mfg. Co., New Britain, Conn.,
Beaton & Corbin Mfg. Co., Southington, Conn.
Canada Metal Co., Ltd., Toronto.
Canadian Wolverine Co., Ltd., Chatham.
Galt Brass Co., Ltd., Galt.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
James Morrison Brass Mfg. Co., Ltd., Toronto.
Steel & Radiation, Ltd., Toronto.

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Ontario Wind Engine & Pump Co., Ltd., Toronto.

Gas Water Heaters.
Galt Brass Co., Ltd., Galt.
Holstream Heater Co., Cleveland.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Pittsburg Water Heater Co., Toronto.

Generators.
James Morrison Brass Mfg. Co., Ltd., Toronto.

Heaters.
Lord & Burnham Co., Toronto.
Steel & Radiation, Ltd., Toronto.

Lead.
Canada Metal Co., Ltd., Toronto.
Galt Brass Co., Ltd., Galt.
Hoyt Metal Co., Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

Mixing Valves.
Canada Metal Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Port Hope Sanitary Mfg. Co., Ltd., Port Hope.

Monkey Wrenches.
Trimont Mfg. Co., Roxbury, Mass.

Packing.
Canadian Wolverine Co., Ltd., Chatham.

Packless Radiator Valves.
Kerr Engine Works, Walkerville.

Pipe and Radiator Hangers.
Beaton & Cadwell Mfg. Co., New Britain, Conn.,
Beaton & Corbin Mfg. Co., Southington, Conn.

Pipe, Black and Galvanized.
Canadian Tube & Iron Co., Ltd., Montreal.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.

Pipe Cleanser
Chamberlain Desolvo Co., Ltd., Toronto.
Canadian Wolverine Co., Ltd., Chatham.

Pipe Cutters.
Trimont Mfg. Co., Roxbury, Mass.

Pipe Joint Compounds.
Canadian Wolverine Co., Ltd., Chatham.
James Morrison Brass Mfg. Co., Ltd., Toronto.

Pipe, Soil, and Fittings.
Anthes Foundry Co., Toronto and Winnipeg.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Toronto Hardware Mfg. Co. Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.
Warden King, Ltd., Montreal.

Pipe Threading Tools and Machinery.
Borden Canadian Co., Toronto.
John Hall & Sons, Ltd., Brantford.
A. B. Jardine & Co., Hespeler.

Pipe Wrenches.
Borden Canadian Co., Toronto.
Trimont Mfg. Co., Roxbury, Mass.

Porcelain Ware.
Canada Metal Co., Ltd., Toronto.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
L. Wolff Manufacturing Co., Chicago.

Pumps.
C. A. Dunham Co., Ltd., Toronto.
Galt Brass Co., Ltd., Galt.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Ontario Wind Engine & Pump Co., Ltd., Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Radiators.
Lord & Burnham Co., Ltd., Toronto.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.

Radiator Foot Rests.
Beaton & Cadwell Mfg. Co., New Britain, Conn.,

Radiator Traps (Steam).
C. A. Dunham Co., Ltd., Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Range Boilers
Toronto Hardware Mfg. Co., Toronto.

Reducing Pressure Valves.
C. A. Dunham Co., Ltd., Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Roof Flanges and Flashings.
Canada Metal Co., Toronto.
Simplex Manufacturing Co., Chicago.

Rubber Goods
Canadian Consolidated Rubber Co., Ltd., Montreal

Septic Tank Valves and Syphons.
Anthes Foundry Co., Ltd., Toronto.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

Solder.
Canada Metal Co., Ltd., Toronto.
Hoyt Metal Co., Toronto.

Steam Specialties.
Dart Union Co., Ltd., Toronto.
C. A. Dunham Co., Ltd., Toronto.
Kerr Engine Co., Walkerville, Ont.
James Morrison Brass Mfg. Co., Ltd., Toronto.
Peacock Brothers, Montreal.
United Brass Founders and Engineers, Ltd., Cornbrook, Manchester, England.

Steam Traps.
Geo. W. Cole Co., Ltd., Toronto.
Canadian Morehead Co., Ltd., Woodstock.
C. A. Dunham Co., Ltd., Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Smoke Test Machines.
James Morrison Brass Mfg. Co., Ltd., Toronto.

Tanks, Steel and Wood.
Ontario Wind Engine & Pump Co., Ltd., Toronto.

Testing Plugs.
James Morrison Brass Mfg. Co., Ltd., Toronto.

Tools.
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Trimont Mfg. Co., Roxbury, Mass.
Williams, J. H., & Co., Brooklyn, N.Y.

Unions.
Canada Metal Co., Ltd., Toronto.
Dart Union Co., Ltd., Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Vapor Heating Systems.
C. A. Dunham Co., Ltd., Toronto.
Moline Heat, Moline, Ill.

Vent Caps
Anthes Foundry, Ltd., Toronto.
Toronto Hardware Mfg. Co., Toronto.

Vitro Tanks.
Cluff Mfg. Co., Ltd., Toronto.

Vacuum Systems of Heating.
C. A. Dunham Co., Ltd., Toronto.

Water Supply Systems.
Empire Mfg. Co., Ltd., London, Ont.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Ontario Wind Engine & Pump Co., Ltd., Toronto
Warden King, Ltd., Montreal.

Monuments To Wolff Plumbing



Michigan Avenue, Chicago, from Seventh Street north to Washington Street.

The following buildings on this world-famous Avenue are equipped throughout with Wolff Plumbing:

1. Blackstone Hotel
2. Congress Hotel
3. Congress Hotel Annex
4. Auditorium
5. Studebaker
6. Chicago Club
7. McCormick Building
8. Stratford Hotel
9. Railway Exchange
10. Orchestra Hall
11. Pullman Building
12. Theo. Asher Company
13. Edson Keith & Company
14. Gage Brothers & Company
15. Chicago Athletic Club
16. Tower Building
17. Ward Building
18. Chicago Public Library

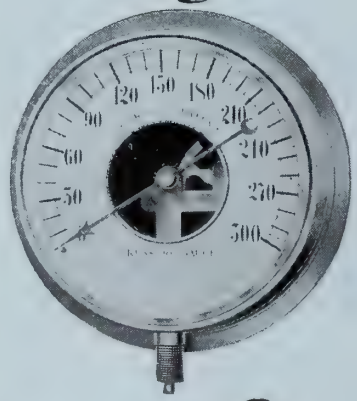
L. WOLFF MANUFACTURING COMPANY

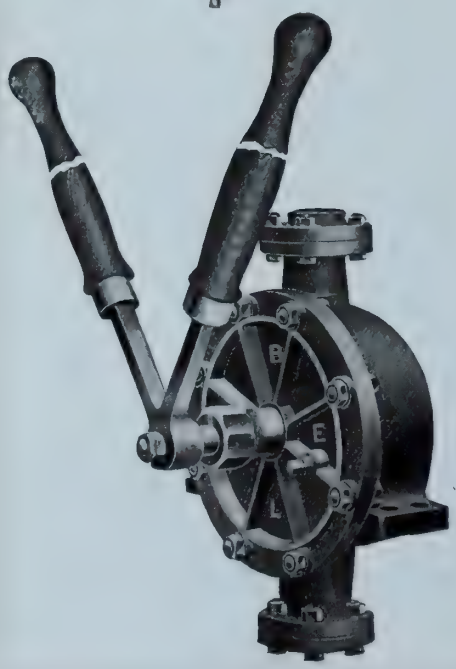
Manufacturers of Plumbing Goods Exclusively

General Offices: 601 W. Lake St. CHICAGO *Showrooms:* 111 N. Dearborn St.









FIVE WORKS—OVER 3,000 EMPLOYEES

UNITED BRASS FOUNDERS and ENGINEERS, Limited

It is our intention after the War to devote our energies to the intensive production of the following Specialities:

Gunmetal and Brass Valves and Cocks.
Steam, Water and Compressed Air Fittings generally.
Cast Iron Stop and Sluice Valves.
Semi-Rotary Pumps.
Extruded Brass and Bronze Bars.
Brass Bolts and Nuts, Studs and General Turned Work from the Bar
Cast and Malleable Iron Cocks and Pipe Fittings.
Pressure and Vacuum Gauges.
Injectors, Engine Governors.
Spraying Machinery.
Coppersmiths' Work.
"Stella" Brand Alloys, Manganese Copper, Silicon Copper, Ferro Zinc, Phosphor Copper and Tin, etc.

Business After the War

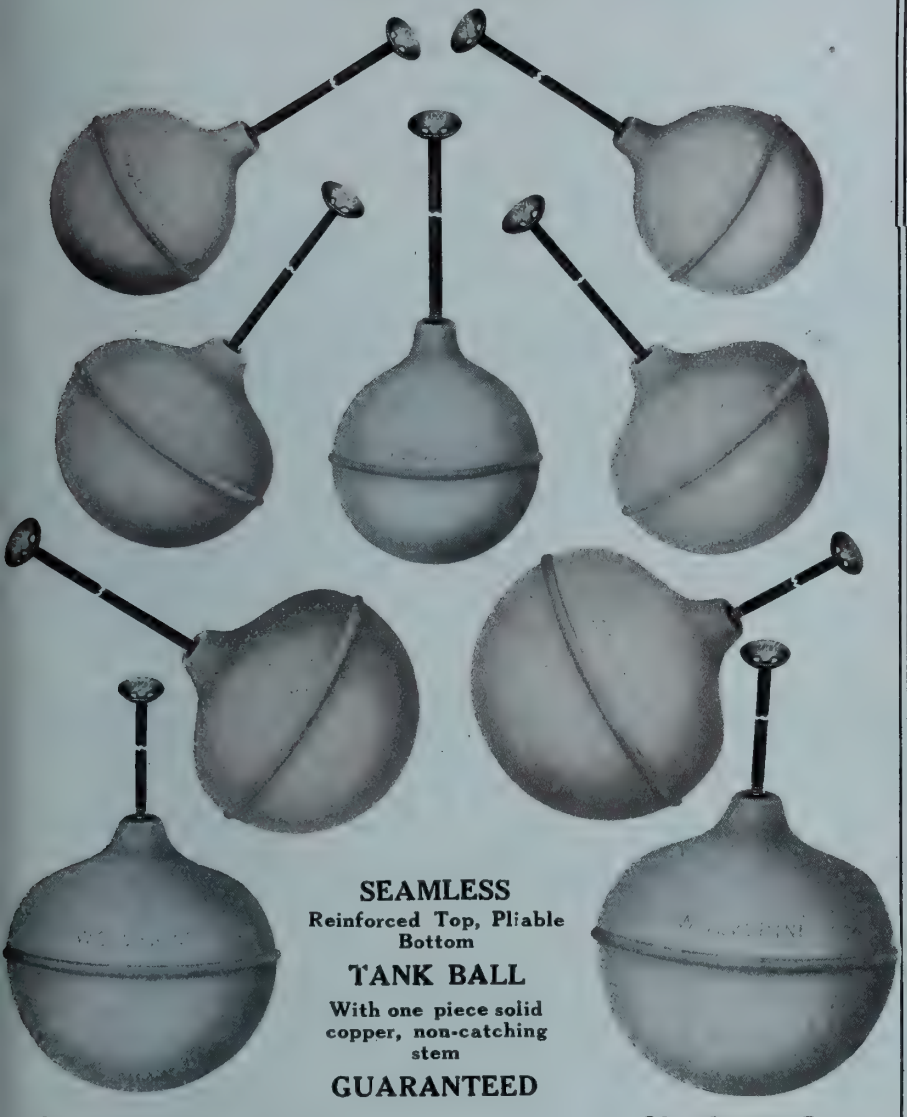
If you are interested in any or all of the lines mentioned and are in a position to take a hand in the energetic distribution of the same, please communicate with us NOW to our Head Office.

EMPRESS FOUNDRY

Cornbrook, Manchester, England

"SURE SEAT"
Wolverine Tank Balls

BEST BY TEST



SEAMLESS
Reinforced Top, Pliable Bottom
TANK BALL
With one piece solid copper, non-catching stem
GUARANTEED

Canadian Wolverine Co., Ltd. - Chatham, Ont.

PURO

(MADE IN CANADA)

Every minute counts in getting maximum efficiency.

Our Puro Sanitary Drinking Fountains positively save 60% in drinking time, besides 35% of water ordinarily wasted. Can you afford to run your plant and lose and waste this money in old-fashioned drinking methods?

EFFICIENCY IS PATRIOTISM



Ask your efficiency expert to figure this out and you will find that:

500 men drink, say, twice a day. Under old conditions it takes between 3 and 5 minutes per man, twice a day. With PURO cutting the time in half, it would save from 1,500 to 2,500 minutes per day at an average wage of 20c per hour. The saving would be from $5.00 to $8.50 per day.

How long would it take to pay for installing our fountains?

NOW IS THE SEASON TO THINK OF YOUR WATER PROBLEMS.

ASK OUR EXPERT ADVICE.

Puro Sanitary Drinking Fountain Co.
147 University Ave., TORONTO, CAN.

WE SPECIALIZE

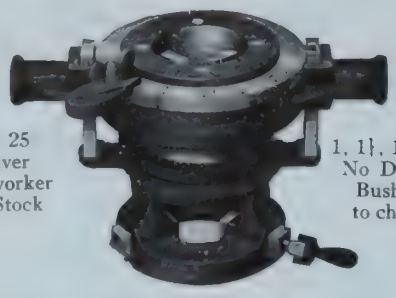
In the Manufacture of

CAST IRON SOIL PIPE and FITTINGS

as well as

GALVANIZED RANGE BOILERS AND EXPANSION TANKS FOR HEATING SYSTEMS

TORONTO HARDWARE MFG. CO., LIMITED



No. 25 Beaver easy-worker Die Stock

1, 1¼, 1½, & 2 No Dies or Bushings to change

You Don't Pay for "Beavers"—

THEY PAY FOR THEMSELVES

Figure it out for yourself! Thousands of Beavers have been in constant use for nearly 10 years—and are still good.

The cost works out at about ½ cent a day for the tool shown in this advertisement.

Call up your jobber now—and order a "Beaver" or at least write for booklet D-12.

MANUFACTURED BY

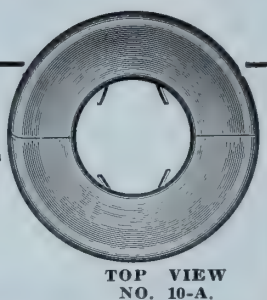
THE BORDEN-CANADIAN COMPANY

TORONTO, CANADA



OPEN VIEW NO. 10-A.

The CEILING PLATE that's better



TOP VIEW NO. 10-A.

THE NO. 10—A NARROW FLANGE PLATE IS A STEEL HINGED PLATE. FLANGES ¾" WIDE. HIGHLY FINISHED. ESPECIALLY DESIGNED FOR TWIN CONNECTION "NARROW."



Gem No. 4.

The split ceiling plate is coming more and more into use than ever and ALWAYS GIVES A NICE FINISH, because it can be attached to mains and risers at the very last, and is not exposed during completion of a building on the floors.

High quality at the right price.

Gem No. 4 Automatic Air Valve

Made from the best brass obtainable. Pressed shell and pressed brass base which eliminate danger from blowholes, which is a fault with cast bases.

Write for catalog showing our complete line of specialties.

The BEATON & CADWELL MANUFACTURING Co.

New Britain, Conn.

Eastern Agent: J. R. Devereux & Co., 233 St. James Street, Montreal. Western Agent: A. E. Hinds & Co., Chamber of Commerce, Winnipeg.

"HAUSE" PIPE JOINT CEMENT

For steam, water, air, oil, gas, gaskets, etc. The cement that cements. Sets like gum. Allows no leaks.

The Great Value of "HAUSE PIPE JOINT CEMENT" lies in its peculiar chemical properties which permits of its hardening and expanding after the joints are made up. In making up joints it has the same effect as a lubricant on the best graphite, and while the joints may be made and broken readily, a perfectly tight joint is maintained at all times. Comes in 1-lb., 5-lb., 15-lb., 25-lb., 50-lb. cans, 100-lb. barrels. Manufactured in ready mixed and powder form. Ask your jobber for prices, or write us direct.

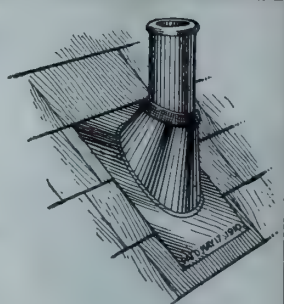


Manufactured in Ready Mixed and Powder Form.

Made in Omaha, Neb., U.S.A., by

Chas. F. Hause Mfg. Co., Inc., Omaha, Neb.

The SIMPLEX adjustable Roof Flange



Fits any roof from ½ pitch to flat—just slide it down the pipe and it will conform with the pitch of the roof.

Trade Price—2" $1.00, 4" $1.15

Made in all sizes—For sale by nearly every jobber

Simplex Mfg. Company - Chicago, Ill.

Canadian Representative: W. H. CUNNINGHAM, 98 Kingswood Road TORONTO, ONT.

"JUST ONE MINUTE"

To call your attention to the Famous B & C Floor and Ceiling Plates.

Our No. 15 style narrow flange designed for the Canadian trade.

One of many styles



No. 15

Handsomely nickel-plated or plain Sizes ½ to 2"

Stock now carried by our Canadian Representative

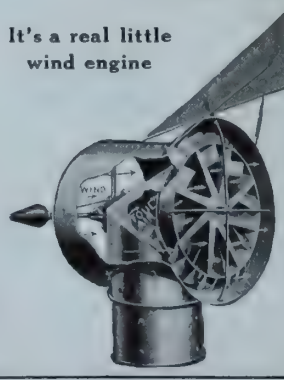
W. H. CUNNINGHAM, 98 KINGSWOOD RD., TORONTO, Ont.

THE BEATON & CORBIN MFG. COMPANY

Southington, Conn., U.S.A.

THE BICALKY

It's a real little wind engine



FAN VENTILATOR

Is a positive suction fan that [illegible] ventilates

The "Bicalky" will dispense with all auxiliary heaters on local ventilation systems.

It is, as far as we know, the most scientifically constructed, self-propelled fan ventilator on the market.

Write us for full particulars.

BICALKY FAN CO.

BUFFALO, N.Y.

Canadian Sales Agents:

J. S. Chapman & Company 89 Jarvis St., Toronto

When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER.

There can be no rust or corrosion in a Dart Union because the face and seat are of bronze.



Dart Unions save time as well as trouble



There is a saving of time as well as an assurance of permanence in using Dart Unions. Pipe lines can be easily and quickly connected, whether in or out of alignment. The ball-shaped joint permits a connection to be made so long as the nut can be started on its thread.

Save time and have a better job by always using Dart Unions.

All jobbers sell them.

Manufactured by

DART UNION CO., Limited

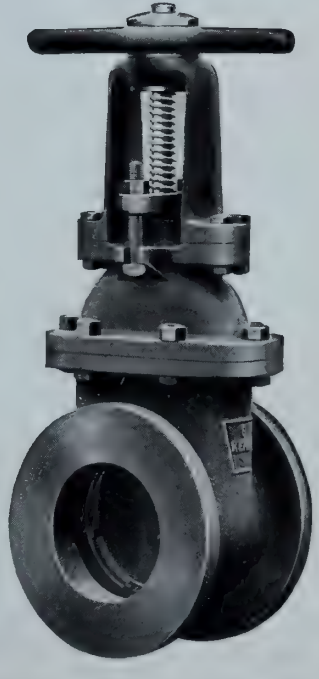
TORONTO, CANADA

There Are Lots of Gate Valves



advertised and sold, but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.

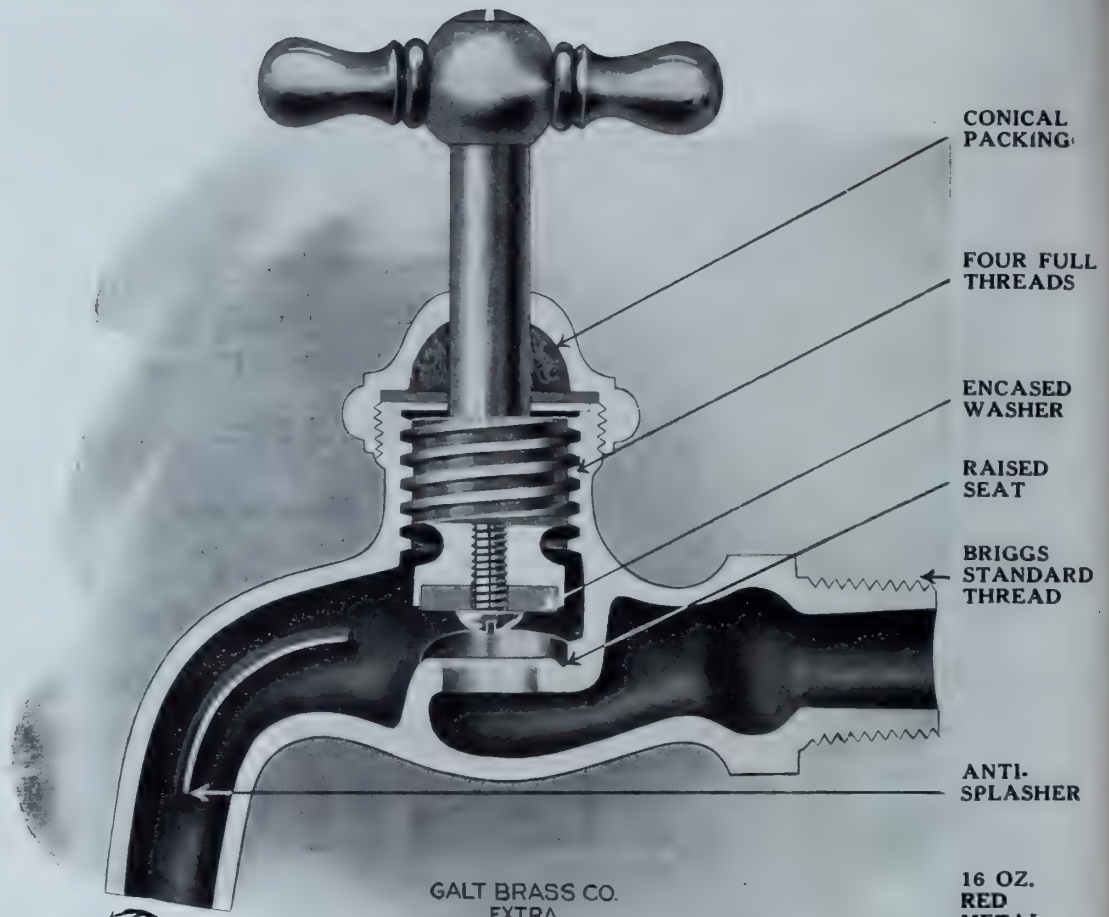
Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.

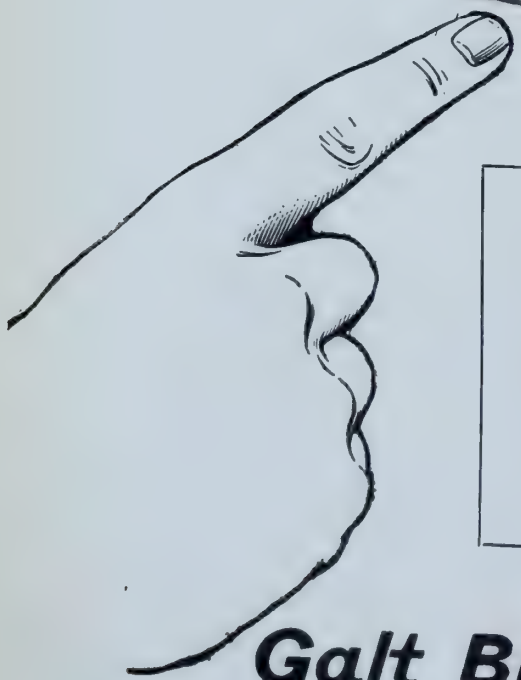
Approved by the Fire Underwriters Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario

Registered **PERFECTO** *Trade Mark*

You Can Install This Line and Establish Confidence of Your Customers





GUARANTEE

Any article of our make proving defective through inferior metal, or improper workmanship, on our part, will be replaced with TWO good ones, at NO CHARGE to you

CAN YOU BEAT IT?

SEND US YOUR ORDER NOW

Galt Brass Company, Limited

Galt, Canada

SANITARY ENGINEER

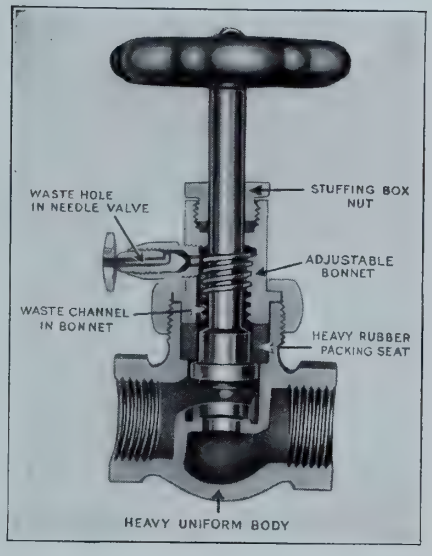
PLUMBER & STEAM FITTER of CANADA

Vol. XII. Publication Office, Toronto, March 1, 1918 No. 5

A Real Compression Stop and Waste Cock



Nothing is so annoying as a stop and waste cock that DOES NOT STOP AND WASTE every time it is closed. In introducing this new line of compression stop and waste, we know it will do all that is required of it.



The following are some of the chief features that go to make up this, our latest model. Just look at the accompanying sectional view. Full weight heavy designed, red brass and accurately fitted in every detail.

Needle valve on waste hole. This does away with the little brass tube or ordinary hole that has become more of a nuisance than anything.

Adjustable union fitted bonnet. This permits the waste valve being turned to any direction, no matter what position the stop cock is in.

Waste channel in bonnet is a good size and will not become easily blocked.

Heavy rubber packing seat which prevents any leaking when the stop and waste cock is open. This is a very important feature.

Ample sized stuffing box with knurled nut can be tightened easily with a pair of pliers.

When writing us or ordering from your jobber, ask for the Empire IMPROVED Compression stop and waste cock. It's a winner and we're proud of it.

EMPIRE MANUFACTURING CO., LIMITED

LONDON TORONTO

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While



A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for BEAVER BRAND CAST IRON ENAMEL WARE

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

ONTARIO:
Monarch Brass Mfg. Co., 71 Brown St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes, 120 Lombard St., Winnipeg

CANADIAN CONSOLIDATED RUBBER CO. LIMITED
DOMINION
RUBBER SYSTEM
AND ASSOCIATED COMPANIES

Extra Service

The service to be gained from any rubber product depends largely upon the quality of the material and the excellence of the workmanship. That is why Dominion Rubber System products are outstanding. Only the best in material and workmanship is incorporated in the making of those products. That ensures long service and life and proves a matter of no little economy to the buyer.

Over half a century of continuous manufacturing has taught the Dominion Rubber System how to produce qualities that will "stand up" under any circumstance and, as a result, the products that carry the name and brand of the Dominion Rubber System are looked upon as the standard by which to judge qualities and values throughout Canada.

For anything in Rubber, write to our nearest Branch, where prompt and intelligent attention will be given to all enquiries.

Canadian Consolidated Rubber Co.
Limited

Head Office - - MONTREAL

Service Branches at Halifax, St. John, Quebec, Ottawa, Toronto, Hamilton, Kitchener, London, North Bay, Fort William, Winnipeg, Brandon, Regina, Saskatoon, Calgary, Lethbridge, Edmonton, Vancouver, Victoria.



The Bowl that never clogs

The B.O.T. Non-Clogging Bowl presents the only type that successfully withstands frost. The free waterways present no resistance to expansion.

One of our customers reports that during the severest weather of the past few weeks he was not once called upon to replace a B.O.T. Bowl, although he had to replace quite a number of other types.

Save yourself and customers trouble by always recommending B.O.T. Bowls.

TRADE B.O.T. MARK

Always specify "C.B." Brass Goods—they mean permanence and satisfaction.

CANADIAN BRASS COMPANY, LIMITED

GALT, ONTARIO

TORONTO BRANCH, 159 WEST RICHMOND STREET

PIPE THREADING TOOLS

It is Evidence Like This



"Toledo" Geared Adjustable Threading Tool No. 2 making a cut and thread on a 4-inch bend in position. It was desired to install a steam separator above throttle of engine, and the whole job was satisfactorily completed without removing the pipe line.

which proves the extra value of "Jardine" and "Toledo" Pipe Threading Tools

"Jardine" and "Toledo" Pipe-Threading Tools cut clean, sharp threads with a minimum of muscular effort. They permit of one man doing work which ordinarily requires two. But even more important than this, they will work in any odd corner. Instance the job illustrated in the accompanying engraving. Here is a case where, with an ordinary tool, the whole pipe line would have had to be taken down. The tool paid for itself on that one job.

Investigate "Jardine" and "Toledo" Tools yourself. Ask us to send names of users in your locality. Then go and talk to these men in your own business and learn what they think of these good tools.

A. B. JARDINE & CO., Limited, Hespeler, Ont.

Sole makers of "Jardine" Pipe-Threading Tools.
Sole licensees to manufacture and sell Toledo Pipe-Threading Tools in Canada.
Agents. Winnipeg and West—Stanley Brock, Ltd., Winnipeg, Man.
Brockville and East—J. R. Devereux, 233 St. James St., Montreal.
Belleville and West—W. H. Cunningham, 98 Kingswood Road, Toronto, Ont.

MORE HEAT—LESS COAL

Canada and United States will require an extra hundred million tons of coal this year for war purposes. The Fuel Controllers indicate that fifty million tons will come from increased fuel production. The balance must be saved by economy in use of fuel.

The acute fuel situation passed through this winter may be much more serious next year. It is the patriotic duty of every Heating Contractor to help save the country's coal supply.



DUNHAM Radiator Trap

This device is one of the fundamentals of the DUNHAM HEATING SYSTEM. Because it makes impossible the presence of water in radiators, it prevents their pounding and knocking, reduces fuel consumption, causes the radiator to heat evenly and quickly, eliminates the hissing air valve and spurting water.

During the past year many unsatisfactory and wasteful heating systems were changed to

The DUNHAM SYSTEM OF HEATING

We will co-operate with you to analyze the defects in any installation you may have. By simple control at the radiator and the application of Dunham Radiator Traps, an even, mild, noiseless heating results.

Dunham Traps do away with the air valves. Air and water are quickly and quietly relieved by the large opening in the Dunham Trap. The result is—COAL SAVING.

Are you acquainted with the Dunham way?

Write for our bulletins.

C. A. DUNHAM COMPANY, LIMITED, Toronto, Canada

Branch Offices:

OTTAWA MONTREAL HALIFAX WINNIPEG CALGARY VANCOUVER

WOLVERINE

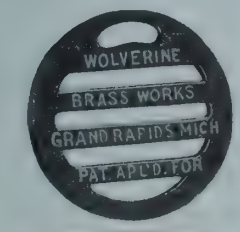
Back Water Valves and Refrigerator Drain Traps are Positive and Sanitary

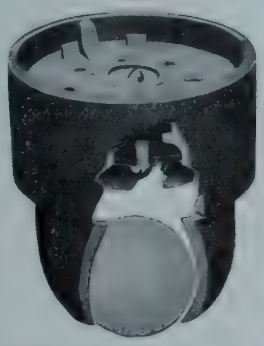
PREPARE FOR HIGH WATER WITH NON-STOPPABLE STRAINERS.

Ball float automatically closes valve when water backs up.

Also provided with closable strainer for emergency shut-off.

Better order to-day than wish you had.





See Catalog "C"





Round or oblong pattern refrigerator drain traps with all parts smooth and perfectly fitted. Hinged and removable strainer.

Spud tapped for 1¼ inch iron pipe. Aluminum finish.

CANADIAN CHATHAM, WOLVERINE COMPANY, LTD. ONTARIO.

THE ARISTOCRAT

WE ARE MAKING

What We Consider to be

the finest and most perfect laundry tub in the Dominion of Canada and we wanted a name for it, offering as prizes

3--50 DOLLAR BONDS



A TUB WITH A NAME



LET US SEND YOU ONE

To three competitors who sent in the best three names, we offered

A FIFTY-DOLLAR BOND

A name has been chosen and the result of the competition will be announced in the next issue of the SANITARY ENGINEER, March 15.

The only conditions were that the competitor must be a master plumber or journeyman in the employ of a plumber and that the decision of the Canada Metal Co. must be final.

The following special features that are embodied in the tubs were given to assist the competitor in arrivingat a suitable name.

- Extra heavy, rust proof, zinc metal rim with solid soldered joints, thus eliminating any sharp, scratchy corners.
- Nickel plated strainers, with independent overflow, thus preventing tub filling above fixed height. This is a splendid improvement over old styles of tubs.
- Two nuts cast in back to fasten cover, or extension back on if required.
- Metal wringer guards moulded solid into ends as well as centre division.
- Round moulded corners, inside as well as outside.
- Outlets placed well away from centre division and tub will drain itself dry.
- Neatly designed substantial legs.

Improved strength and quality from use of trap rock and best Portland cement, and will not absorb moisture.

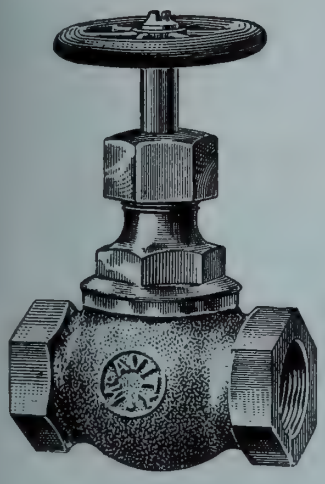
THE CANADA METAL CO., Limited

TORONTO, CANADA

Hamilton Montreal Winnipeg Vancouver

WE HAVE EVERYTHING FOR THE PLUMBER

We have yet to see a Better Valve than the



"McAvity" VALVE

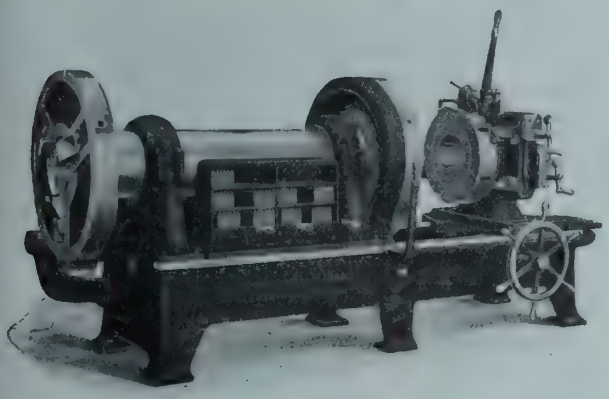
Every Valve packed and tested before leaving factory.

Let us quote you a quantity price. Prompt shipment from stock.

T. McAVITY & SONS, Limited

Montreal **ST. JOHN, N.B.** **Winnipeg**

Pipe Machines of Merit



THE HALL No. 8

Duplex Improved Gear Box Driven. Capacity 2½ in. to 8 in. inclusive.

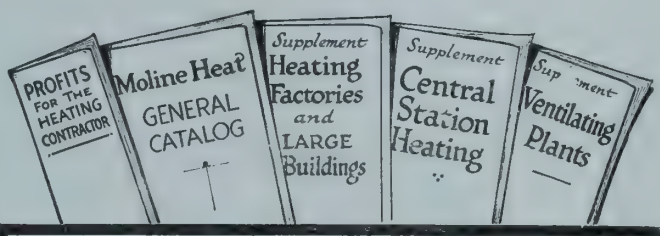
Note the drive belt at rear out of operator's way. Elevated die cabinet, control lever and speed levers all convenient to operator's right hand. Sliding die head.

These machines are equipped with a friction clutch, enabling operator to revolve pipe a few inches, if necessary.

Pipe Machines ranging from ⅛ to 18".
Nipple Machines ranging from ⅛ to 4".
Roller Pipe Cutters ranging from ⅛ to 4".
Delivery from stock.

Write us for full particulars and prices.

John H. Hall & Sons, Ltd., Brantford, Can.



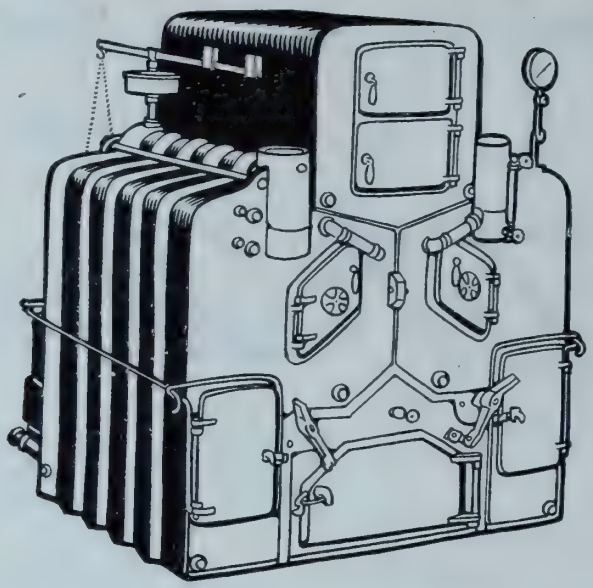
These Valuable Books *Free!*

Each one is worth big money to you. Every heating contractor should have them. They cover all the latest money-making ideas in figuring and installing steam heat—hot water heat—vapor heat—and vacuum systems.

These books will help you to land more orders and increase your profit on every job. Write for them at once. They are absolutely *FREE!*

Moline Heat EVERYWHERE

Moline **Illinois**



An Adjustable Magazine Throated Boiler

Its Name is "THE NEWPORT"

WHEN it somehow leaked out, before it was intended, that we were to be distributors for the Newport, a lot of the dealers jumped right at us for full particulars. All we could do then was "stall."

But now we are ready to do business on what we believe to be the very best magazine boiler made anywhere by anybody.

It has two big features. First, that the magazine throat is adjustable, so it will burn any grade or size of fuel. Second, that it is made for steam as well as hot water.

Next in importance is that it is made of cast iron *throughout*. Not, mind you, cast iron combined with sheet iron or steel. But cast iron from stem to stern.

It is made in sections *throughout*. Not part sections. Part not.

It is push nipple connected.

It has a rather wonderful grate, with what might be called two speeds. High speed at the part where most shaking is required. Low speed on the rest. One shaker handle operates both speeds at the same time.

It will be a long time before folks forget the coal troubles of this season. There is going to be a big sale for a boiler that will burn low-grade fuel.

The Newport is that boiler.

How about it—want further facts and prices?

Lord & Burnham Co. Limited

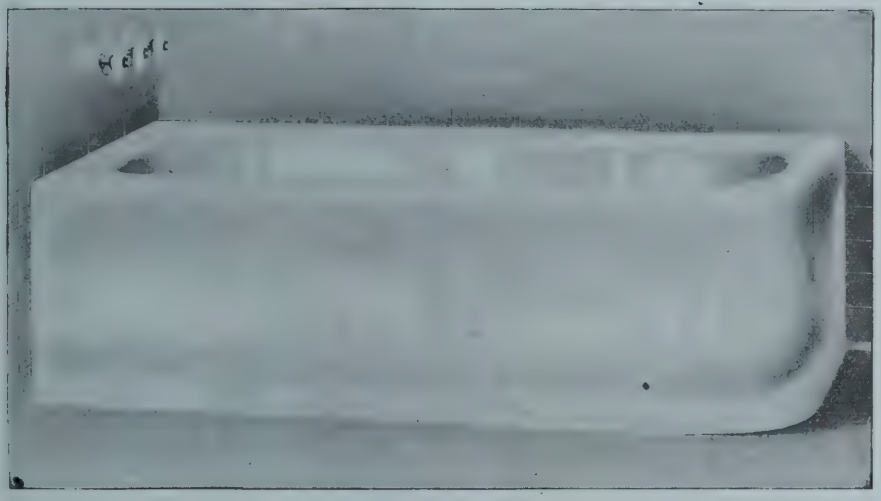
(Boiler Department) Of Canada

ROYAL BANK BUILDING, TORONTO

Factory: St. Catharines, Ontario.

"Standard"
"Perfection" Built-In Baths

Made in One Piece Enamelled All Over



These Baths represent the last word in design and finish, and are made to build into Right or Left Hand Corner or into a Recess.

The "Perfection" Built-in Bath is only 17½ inches high, therefore convenient. It builds into walls and floors, the absence of all dust-collecting cracks and corners, meaning bathroom sanitation.

Made in 5 and 5½ foot sizes.

Illustrations on request.

Write the nearest dealer.

Standard Sanitary Mfg. Co.
Limited

General Office and Factory, Royce and Lansdowne Aves., Toronto, Ontario

Toronto Store:
55-59 Richmond Street East

Winnipeg Showrooms:
76 Lombard Street

Hamilton Store:
20-28 Jackson Street West

Montreal:
4 Beaver Hall Square

Calgary:
31 Canada Life Building

Vancouver:
847 Beatty Street

"MADE IN CANADA"

SANITARY ENGINEER
PLUMBER AND STEAMFITTER OF CANADA

Vol. XII. TORONTO, MARCH 1, 1918 No. 5

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EDITORIALS

Progressive Measures—Frozen Water Pipes—Value of the Trade Press.

The MacLean Publishing Co., Limited

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Those Good Resolutions

The resolutions you have adopted to help make Nineteen-Eighteen your very best business year will gain added force if you determine to hitch up to Port Hope Enamelware.

Port Hope Enamelware makes a splendid running mate to **good** resolutions because it is so good itself. Like the sincere resolution Port Hope Ware countenances no half-way measures. It is made up to a rigid standard of quality—no seconds—every piece "first grade."

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SANITARY ENGINEER

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The Line of Least Resistance

Moses Irons Entertained a Customer from Clay Hollow, Minnesota, and Gets Track of a New Way to Add Thousands of Dollars to His Profits—You'll Find a Sound Practical Lesson in This Business Fiction Story

By Danield Louis Hanson. Illustration by Charles D. Mitchell.

BYSHEC was out that morning and John Renwick, vice-president in charge of sales, was in New York City; also there was in charge of the information desk a youth who looked upon Moses Irons as the entire establishment. It was this combination of circumstances which resulted in Ezra Ambrose from Clay Hollow, Minnesota, being ushered into the front office and given a desk seat opposite the ironmaster.

Three minutes later Moses Irons, with a pad of order blanks before him, was busily taking down a requisition from the long list Ambrose had on the backs of a lot of envelopes. Nor would Moses Irons brook any interruption. Ben came in with a bunch of expense accounts—Moses Irons loved to go over expense accounts—but he was waved out with a frown. The treasurer opened the door to ask a question about the bank balance, but he was met with: "I am busy, John, and won't have time till after lunch."

Then with his best smile to Ambrose the ironmaster went on, "Did you say three lengths of three-quarter-inch pipe? Suppose we make it a full bundle of 120 feet? Yes, we have an excellent quality of rod couplings—any amount you may need, Mr. Ambrose—a dozen, thank you."

That afternoon the head bill clerk in reply to a question from the treasurer stated that Ezra Ambrose's entire purchase bill ran a little over $50. At this the treasurer went back into his cubicle of an office and wondered at the idiosyncrasies of his chief. And the more did he wonder when that evening, as they motored homeward together, Moses Irons said: "Had a man in from Clay Hollow this morning and took him to lunch. His coming in meant many thousands to us."

To this the treasurer could not forbear to reply: "Yes, I initialed it for credit; about $50, wasn't it?"

"The trouble with you credit men is that an order means only so much in itself, John. You never see that a customer gives us something besides that much in the way of a specification. Good will counts for nothing with you, nor does the information an outsider brings to us. Now I wouldn't have missed meeting the man from Clay Hollow for a good many thousand dollars; he brought to my attention what I should have known was going on—what I really did know, as a matter of fact, but was ignoring to our loss—the method we have fallen into of letting the small towns buy from us if they wish, but making no effort to sell to them.

There is Clay Hollow, a town of 1,500 passing through, to us, the most profitable period of its corporate existence—the first two years of possessing a waterworks plant. Here this man Ambrose is left to make the fight for plumbing and heating jobs all by himself, for the other jobbers and manufacturers are as negligent as are we; it's an American crime, I imagine, this of neglecting the hollows and touching only high spots."

"Why doesn't Jessup make the place? He has all that territory," was Jameson's practical comment.

"Why haven't we kept Jessup after those small towns, you mean? Don't expect the salesman to go after the little places unless we key him up to it. It's our fault that the salesman is at fault. Water never rises higher than its source. Sales effort doesn't often get more intense in the salesmen than it is in the sales manager, nor in him than it is in the head of the establishment. I have been at fault and as soon as Renwick gets back it's me for the hollows of Minnesota and the depressions in our selling department at one and the same time. What is there doing across the water to-night, anyhow?"

II.

Clay Hollow is, so Moses Irons found a week later, at the end of a narrow gauge road some 30 miles west of the main line at the river. It was a "hollow" because the railway station was so located; but the rest of the town hung on the hills, above, terraced one street above the other. On the topmost elevation the water-works tank raised itself as a mark of Clay Hollow's metropolitan enterprise.

The hotel in which Moses Irons found himself was without lavatory facilities except the familiar white pitcher and wash-basin. But the room assigned to the ironmaster was immaculately clean and actually inviting. All of this indicated to the shrewd business man that the proprietor would be an eager customer for modern improvements, were he properly approached.

After supper Moses Irons discovered the shop of Ezra Ambrose on the only strip of level ground in town—that by the depot. The shop was a ramshackle sort of affair, fairly well stocked with the ordinary stuff that goes to make up the wants of the householder in the fundamental needs of sanitary improvement—pipe, fittings, and hydrants. That was all—simply the stuff which meant little velvet, if any, either to manufacturer or dealer—just labor to the latter.

Somehow that condition was sensed by Ambrose, though he was a man without any special business training, a me-

A STORY FULL OF MEAT.

As will be seen, this story is entitled "The Line of Least Resistance," and deals with human conditions that can be overcome in a human way. Many writers are prone to say that it is human to err. Nothing of the kind, else would civilization have made such progress as it has? There is, however, one condition that has not been improved to date in the plumbing trade, and that is we as a craft are not looked upon by the public with that feeling of confidence which we would crave. We have not as yet tried to win the confidence of the public. We have not become service salesmen, and it is only by reading such magazines as "System," in order to learn what other business men are doing, and following in their footsteps, that the sanitary and heating trade can ever hope to succeed as it should. "System," along with their own trade paper, "The Sanitary Engineer," should be in the possession of every member of the craft.

We have been too content to go on in the same old way and conduct our business in an unbusinesslike manner, and then when the reward has not been forthcoming we have murmured.

The writer has often been inspired by "Moses Irons" and just as often felt like taking a slam at "Renwick," simply because, somehow or other, "Renwick" has appeared very much like a few bosses and efficiency men that come to one's notice.

If a few city sanitary and heating engineers would get out into the country we feel that there are lots of manufacturers who would do like "Moses Irons." Send out their "Jessups" to "jes' pick up" the business and hand it over to the trade.

—Editor.

chanic skilled in his line. "I know that this sort of game doesn't free me from being just a workman—working under myself as boss, but not a merchant," he clearly put it. "I have your catalog. I wrote for that when I started; but men such as I—and there are thousands of us in this country—can't build up a business merely through catalog inspiration. I know it isn't fair to the town as a whole, which has gone into debt for this water plant, nor to the people in it, who should be worked up to buy sanitary conveniences. But if the big houses don't reach out and develop their lines by giving us a lift, then—"

A little later he was saying to the sympathetic ironmaster: "We hear so much about America reaching out after the war is over for European trade. Why don't they work up the field in this country? Europe will have to borrow money with which to buy goods from us; our country stands with open pocketbooks and the manufacturers don't reach out for them. The only way you can get this wealth is through us, the retailers or the middlemen, as we are called. That is why you manufacturers should help us—and yourselves at the same time—to what my boy in the agricultural school calls 'intensive cultivation' of the field. Don't you suppose that Clay Hollow could take up $10,000 worth of plumbing fixtures in the next year and not be overstocked?"

"Twice that, Mr. Ambrose, easily twice that."

"Add to that the cost of labor and the dealer's profit, and see what you have in the way of business as compared with what I am able to do all by my lonesome. There are effective sales methods in handling any line; there must be some in sanitary goods."

"There are. And we are going to put them at your service within 24 hours, or less," said Moses Irons. "We have a salesman who in the future will 'make' Clay Hollow. I'll reach him at Minneapolis to-night by long distance. I might stay and help you out myself, but that would be 'patching' and that is something I don't believe in. Where is the nearest long distance telephone?"

Jessup arrived the next noon and, after an illuminating conversation with Moses Irons, he was in full swing by two o'clock. By evening he had sold for Ezra Ambrose a full set of bathroom fixtures to the optimistic banker and by the next evening he had booked three more sets of sanitary goods. All of which, of course, meant velvet both to the plumber and the supply man. Moses Irons stayed over and made a close study of small town methods.

What impressed him most was the amount of wealth Clay Hollow had at its disposal—wealth that the possessors were willing to spend in large part for more comfortable living if some one would only show them how. Retired farmers were there in Clay Hollow, men and women in the fifties who really wanted to spend their money for everyday living comforts. But there were none to teach them how.

Moses Irons met one such man in the village park; he was fairly insistent with his questions about "water-works in the house" when he learned that the stranger was in that line. He insisted on having Moses Irons go up with him to look over the structure to see if he could instal modern improvements in his home. Two weeks later Jessup and Ambrose booked a job from him.

Another, a grocer who lived at the hotel, sold himself a set of fixtures for his store—Ambrose was too busy to see him just then. "I am going to have a rest room for my out-of-town trade," he said, "and I expect Ambrose to do the fair thing on prices."

From Clay Hollow Moses Irons and Jessup, after a three days' sojourn, went to the not far distant town of Heliopolis. This town with a classic name presented much the same situation as had Clay Hollow. That it had a few more people and two men in the line had not served to keep it out of the "undeveloped" class. Here Moses Irons left Jessup and returned to Chicago, but not before he and his salesman had indulged in a heart to heart talk, somewhat as follows:

"The inspiration talks, or write-ups, we get weekly about doing our duty," said Jessup, "how so and so is setting the world afire out on the Pacific Coast or down on the Atlantic Seaboard, haven't a great effect on us. We get used to that dope. We are out to make money for ourselves and we can't do that without playing the fair game with the house. Now the small town offers a good field, but not, of course, the yield that does the big city. That is why we stay away from such places. If you will make it profitable for us to work the smaller towns once in so often, they will be worked. Yes, I know all about loyalty to my house. Let any outsider make an attack on it and I am there to defend it stoutly. I put in all sorts of work for that house, but I know enough to defend myself against my house when our interests clash. I don't want to criticize any particular sales management—I aim at all—but sales managing seems to consist mostly in kicking the clutch into 'high' and holding here there regardless of whether there is gas in the tank or oil in the bearings. 'Hang gas, oil, brake lining, and the rest—it's the clutch we are interested in and in "high" we will hold her,' is what they cry. Now when I happen to be a clutch, it is up to me to demand that gas, oil, brake lining, and a few other essentials, be furnished. If they are not, then I must disclaim responsibility if the car doesn't move."

"You mean that our sales manager has no set program except to crack the whip and—"

(Continued in next issue.)



Moses Irons, with a pad of order blanks before him, was busily taking down a requisition from the long list Ambrose had on the backs of a lot of envelopes.

Hamilton, Ont.—An appraisal of $2,937,735.01 has been placed on the Hamilton, Ont., waterworks system by the city engineer, E. R. Gray. The valuation was made after close deliberation upon a basis of appraised value less depreciation, the normal years of 1914 and 1915 being used as a starting point.

Toronto S. & H. Engineers at Buffalo

Members of Toronto Society Cordially Welcomed and Entertained by Members of Craft in Buffalo—Visit Theatre and County Jail—Return Visit to Toronto Planned

LEAVING Toronto by special chair car, on the Canadian Pacific Railway, at 1.15 p.m., the Toronto sanitary and heating engineers to the number of twenty-one, under the careful chaperonage of Mr. George Clapperton, who was ably assisted by secretary Garrett F. Frankland and chairman Harry A. Farthing, of the entertainment committee, arrived in due course at Black Rock, where the advance guard of Buffalonians were met. The passports of all being in order, the party continued on to Buffalo, where they were taken in charge by the Reception Committee of the Buffalo Plumbers' Association, under the able command of General William Dechert, President, and Honorary Colonels, Captains, Lieutenants and Privates, Sam Wright, John Kavany, J. J. Bresnahan, George Drake, George D. Clucas, Thomas J. Kavany, August Ebke; Fred Yuhl; Henry Dechert and others.

All hands were ordered to fall in, and wended their way to Hotel Statler, where they were served with a most bountiful repast, excellent in every degree, and appreciated by all from start to the end of what came in the jugs, all of which showed that Food Controller Hoover must have been looking the other way. President William Dechert welcomed the party on behalf of the Buffalo Association in his own irreproachable manner, extending to all the hand of good fellowship. Harry Hicks replied on behalf of the Toronto craft, and thanked President Dechert and his associates for their kindness to all.

Forty odd enjoyed the hospitality of the Reception Committee, after which they journeyed to the Association Quarters, in the Builders' Exchange Building, and participated in what was the first international meeting of the Buffalo and Toronto craft.

President William Dechert presided, and in a most pleasing style extended to the Toronto craftsman the fullest privileges of the meeting, especially requesting them to join in the debate, and point out any feature that struck them as being different.

Secretary Frankland expressed for all the Toronto craft, those present as well as those at home, the heartiest thanks for the generous hospitality bestowed on the visitors, and especially for the genuine good fellowship expressed in the President's welcoming address, which made one and all consider themselves right at home, as each one showed themselves to be from start to finish. The pleasure of being present on this occasion of the first international meeting of our craft was one that would long remain in the memory of all present, and while it was the starter, the hope was expressed that it would not be the last. All the Buffalo craft were invited to attend a meeting of the Toronto Society at an early date and were assured of a try on the part of the Torontonians to equal this bountiful hospitality and generous good treatment that had been shown to all by their Buffalo cousins.

(Continued on page 21.)



A FEW OF THE MEMBERS WHO VISITED BUFFALO

1. John Gowan	2. John Cracknell	3. Roy Belyea	4. H. Farthing	5. N. Swanston
6. G. Ritchie	7. Ross Belyea	8. C. Chapman	9. A. F. Passmore	10. Fred Hogarth
11. R. Shannon	12. W. Cameron	13. G. F. Frankland	14. Fred Wales	15. Frank Kelly

Sixth Annual Salesmen's Convention

Canada Metal Co., Toronto, Hold One of Their Most Successful Salesmen's Conventions, Every Representative Present From Coast to Coast—Plumbing Branch Makes Great Strides

THE Canada Metal Co., Ltd., held the sixth annual convention of their sales staff at the head office in Toronto commencing the week of February 4. Representatives of the firm from all parts of the Dominion were present, trade conditions were discussed on all territories from the Atlantic to the Pacific coasts, and it is stated that a most interesting and successful convention was the result. One salesman stated, "I have been selling metals all my life and the first year that we met I thought there was nothing more for me to learn, yet when I hear the views and experience of our other salesmen, I decide that as long as I live it will be necessary to come to these conventions with an open mind ready to digest and benefit all that is possible by the knowledge of others.



W. G. HARRIS, Sr.
President, Canada Metal Co.

The exchange of ideas and experiences gives a wider viewpoint and educates one for all emergencies.

W. G. Harris, Sr., president of the company, gave an address of welcome and expressed his great pleasure in once more meeting the staff.

Only once a year he said it is possible for us all to meet and year by year the family grows and to-day we have here the managers and their salesmen, not only from head office, but also from our factories in Hamilton, Montreal, Winnipeg and Vancouver.

In 1911, he further added, we moved to our new factory on Fraser Avenue and to illustrate the growth of our business may state that not only is our staff increased by more than twenty salesmen but this factory has been enlarged five times in the period to cope with the great demand for our goods. We have also built factories and are manufacturing most of our lines in Montreal, Winnipeg and Vancouver. Our progress, he continued, has been remarkable and our success has been built on a sure foundation. The motto we stand by is "SERVICE and DEPENDABILITY." Give excellent service, manufacture and sell goods of dependable quality and success is bound to follow.

Mr. Harris also gave some good sound advice on square dealing. Know your business, said he, learn all there is to know about metals. Ask questions. Teach and be taught and thus ensure closer co-operation, and he told how, during the convention they would have the opportunity of seeing many lines manufactured so that they could gain an accurate knowledge of what they were selling and how and under what conditions various goods were manufactured.

Mr. Harris, Jr., vice-president, presided at the convention and opened by going through the annual report and he gave some interesting figures. All sales have increased and 1917 was the best year to date.

He further pointed out that no firm can stand still. It must either go ahead or go behind and to go ahead after a successful year required greater efforts, more concentrated efforts, and more carefully organized efforts. Particularly is it necessary to take into consideration that some day the war will end and give every business a tremendous jolt during the re-organization which is bound to follow. Only those firms who prepare for after war conditions can hope to reap the benefit when normal times arrive and this is our reason why the organization must be kept to the highest pitch of efficiency.

Thirty-four times on the agenda and following the review of general sales was the presentation of the prizes for the various sales competitions. Then came a visit to the lead rolls and samples of Galena lead ore were exhibited and an address on how the ore was mined, smelted, and in some cases treated by electrolytic process to give the pure lead.

Then following the melting of the lead into slabs, sheets were rolled in various thicknesses from 1/16" to ¼" and in widths up to 7' 6" and various lengths. Next a visit was made to the small rolls where the process of rolling lead and tin foils was witnessed.

Another Session was taken up in reviewing the sales of babbitt metals for 1917. Mr. Harris, Jr., gave a very interesting address on this subject illustrating the real meaning of specific gravity of babbitt metals.

An exhibition of how to pour babbitt metals to give best results was made most instructive.

The question was asked by one of the salesmen "Why do we guarantee our babbitt metals to give excellent service?" This opened a subject full of discussion and to illustrate and give a practical demontration of its manufacture, first, a visit was made to the laboratory where tin, antimony, lead, zinc, copper, etc., were tested by the metallurgical chemist. Then the melting pots were visited where three of the largest were being operated. Each of them have a capacity of 35 tons. During the melting process more laboratory tests were made to prove the accuracy of the alloy and later in the day after the metal was poured, another tests was made on the friction testing machine.

At the conclusing of the babbitt metal



W. G. HARRIS, Jr.
Vice-president, Canada Metal Co.

discussion came one of the most interesting events of the convention, when Fred Harris, manager of the Winnipeg branch, presented a gold watch and chain to Messrs. D. L. Scott and E. Parkin, who have been successful in the Harris Heavy Pressure Competition.

Another Session was given over to ingot metals so that salesmen would thoroughly understand what they were selling. Samples of copper ore, zinc ore, lead ore, phosphor tin, antimony, and phosphor copper were thoroughly dealt with.

Metal conditions for 1917 were reviewed and prospects for 1918 discussed and the effect the war upon the metal industry brought out some most interesting details.

Type metals were also fully gone into and following this came the manufacture

of solder of various grades. The salesmen after going minutely into all the points of solder, as to quality, &c., were taken through the factory to see the manufacture of bar solder, slab solder, wire solder and ribbon solder.

Each day lunch was served at the Sunnyside pavilion

The salesmen were encouraged to give addresses and to illustrate the practical and interesting subjects the following might be noted.

Humanity in Business.—E. Parkin.

Contracts.—F. Harris.

What we are doing in Winnipeg.—W. G. Garrett.

Sales assistance from the office.—M. Matthews.

Regular production of business, co-operation, trade and its prospects in Nova Scotia and New Brunswick, &c.

Plumbing in all its various details was a long seesion.

Then followed a visit to the lead pipe presses and lead pipe of all sizes, taps and bends, &c., were made.

Another session was taken up giving practical demonstration of the manufacture of brass goods, such as soldering nipples, brass ferrules, &c.

It was pointed out that quite a number of lines in connection with the plumbing branch had been added and improved, a new plant for the express manufacture of a new laundry tub had been added since last convention and the outlook for this line looked very promising. L. J. Martin of Toronto was successful in winning one of the prizes in the sales competitions. Every member of the plumbing trade who knows him will be pleased to congratulate friend Martin.

One evening was given over to a smoking concert held in the large showroom at the head office and at which, in addition to the salesmen, the whole office staff and the foremen of the various departments were invited. This was a great success and the fun was fast and furious and when the convention song was sung it made the rafters ring and was only second to the hearty way in which the National Anthem brought the concert to a close.

At the conclusion of the convention votes of thanks were given to Mr. W. G. Harris, Jr., and Mr. H. C. Crow. Mr. Harris, Sr., in response stated that even though it meant a tremendous amount of thought and care to prepare and carry a convention to such a successful issue, it was labor well worth while when every one took such intense interest in it and he hoped that each one would go away feeling that a greater knowledge of the goods manufactured by the Canada Metal Co., Ltd., had been gained and that they would feel satisfied that the aim to give service and maintain the reputation for denpendability was well backed up by equipment in each department being the best that money and brains could produce.



Rolling sheet lead.

MONTREAL WATER SUPPLY TO BE INCREASED

The consumption of water in Montreal has so increased that a report has been submitted to the Board of Control by Chief Engineer Mercier pointing out the necessity of increasing the water supply by 1919, by which time the estimates of the present concrete conduit will no longer suffice. The consumption of water at present is sixty-six million gallons a day, an increase of ten million gallons over last January.

LEAK IN CHATHAM WATER SYSTEM

A serious leak in the Chatham waterworks system which is involving heavy wastage has been discovered. Every effort is being made to locate the cause of the waste. The pumps are drawing five hudred gallons a minute more than the actual consumption. The wastage is believed to be due to a leak in one of the mains crossing the river.



Laboratory where tests are made to ensure uniformity of materials.

PRACTICAL SHEET-METAL WORK

THREE PIECE ELBOW WITH GUSSET OR GORE PIECE.

BY THOMAS STANFIELD

IN plate 27 is shown how the patterns for inside and outside mitres for an eavetrough may be developed. It is not by any means a difficult one to make. The same method is followed for all kinds of moulding, or other cornice work where mitres are required.

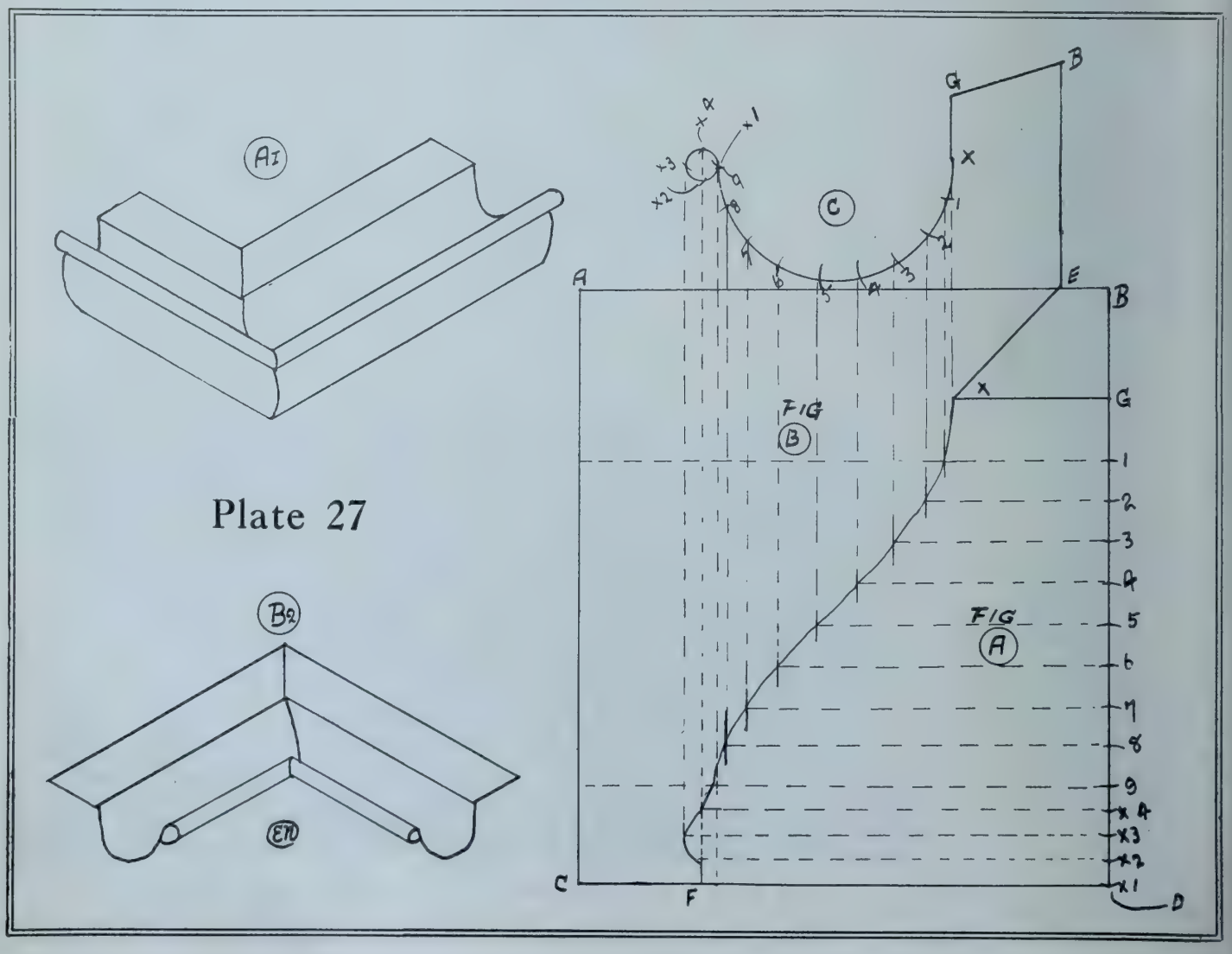
Fig. A1 is a perspective view of an outside mitre. Fig. B2 is the perspective of an outside mitre.

We will now proceed with the developing of the pattern. First draw an elevation plan and size of eavetrough required as shown in Fig. C. It may be here stated that while the trough we are showing is a simple half round one, it does not matter what style or size is required, the same method is adopted.

When plan as shown in Fig. C. has been drawn erect vertical line B.D. being the total length of material required, then draw horizontal lines A, B, C, D, these being long enough to make the two pieces of the mitre if new material off large pieces is being used up, but if small pieces are to be used any size large enough.

Having drawn lines A, B, C, D, forming almost a square as shown, proceed by spacing off pattern as shown in Fig. C, viz.: B, G. x 1, 2, 3, 4, 5, 6, 7, 8, 9, x1, x2, x3, x4. These spaces being necessary to form the stretchout, transfer these spaces to vertical line B, D. as shown, then erect lines as shown from x, 1, 2, 3, etc., in Fig C. Next draw horizontal lines, G, x 1, 2, 3, 4, 5, etc., so as to intersect the various vertical lines of the same numbers. Then draw line as shown where these vertical and horizontal lines meet or intersect as shown, this being the pattern. The portion marked Fig. A being pattern for outside pattern as shown in plan A1. If

(Continued on Page 33.)



Reducing Valves: How They Operate

Showing Some of the Most Important Features in a Number of Popular Pressure-Reducing Valves—Where High Pressure Steam Plants Are Furnishing Steam For Heating Systems, the Best Reducing Valve is None Too Good

PRESSURE REDUCING VALVES—I.

THE ever increasing complexity of modern manufacturing processes renders it necessary in many factories to use steam at widely different pressures — heating, cooking, dyeing, boiling and drying, etc., are some of the numerous applications with which readers are familiar. Frequent use is also made of reducing valves on board ship, where the high pressure necessary for the main engines is reduced to pressure suited to the various auxiliaries throughout the ship. In both cases, the necessity exists for a device which will automatically control the flow of steam from the



FIG. 1.—EXTERIOR VIEW OF "J.M.T." REDUCING VALVE.

the main engines is reduced to pressures system, operating to close down as the low pressure builds up when not in use, and opening up to pass more steam when additional demands are made on the low pressure system.

In view of the damage which might ensue from an unexpected or uncontrolled rise of pressure in many plants, the necessity of using reliable apparatus will be admitted, and the several types of valves on the market to-day are the result of many years of attention and experiment by makers and users over a wide range of conditions. Usually the initial or high pressure is subject to more or less radiation through ...ite wide ranges, and, as frequently occurs, the low pressure side is also liable to variation at the same time. This latter condition alone has been one of the most difficult conditions influencing reducing valve design and it has been the aim of all modern designs to meet this condition with the simplest possible mechanism.

"J. M. T." Reducing Valve

An exterior view of this valve is shown in Fig. 1, and a sectional view in Fig. 2, the manner in which the reduced pressure is maintained at the desired degree being understood by reference to the numbered parts thereon. The main valve 19, is held on its seat by spring 18, the upper end of which rests against the fixed socket or bushing 7. This bushing forms a guide for auxiliary valve 8, which seats on the bottom end of bushing and controls the admission of high pressure steam to the port 15, which in turn is connected by a small passage (not shown in cut) to the underside of piston 11 below main valve 19. The upper end of auxiliary valve 8 makes contact with diaphragm 6, the underside of the diaphragm being subject to steam pressure from the reduced side through the passage shown at the left. This pressure is opposed by the action o spring 4 on its upperside, suitable adjustment being obtained by handwheel as shown.

When there is no pressure on either side, the main valve is closed and the auxiliary valve is open. When high pressure steam enters the inlet, it immediately passes through auxiliary valve and ports to the underside of piston 11, which, because of its larger area, raises main valve 19 off its seat and allows steam to pass to the outlet. The pressure on the reduced side now increases to the point at which regulating spring 4 is set, and when slightly in excess of it, raises diaphragm 6 and allows auxiliary valve 7 to close slightly, the upward movement of this valve being obtained from spring 14. This movement reduces the flow of steam to the piston 11, which is a loose fit so as to allow a free leakage to the outlet. When the amount of steam passing the auxiliary valve becomes less than that leaking past the piston, the piston will be pressed down by the pressure of spring 18 on top of main valve, and the flow of high pressure steam reduced accordingly.

This action takes place in greater or less degree, according to the amount of low pressure steam required, the main valve assuming a position which furnishes just sufficient steam to maintain the desired pressure on the low side. Should the outlet be closed the pressure forces the diaphragm up far enough to allow auxiliary valve to close completely, thus removing all supporting pressure from piston 11, and allowing main valve to close tight till such time as the outlet pressure falls and allows diaphragm to open auxiliary valve again.

This valve is made in a full range of sizes and in various styles by the James Morrison Brass Mfg. Co., Toronto, and is furnished for ranges of reduction from 5 to 50 lbs., 50 lbs. to 140 lbs, and 140 to 300 lbs., these being obtained by substituting springs of suitable strength.

Fulton Reducing Valve

This valve is illustrated in Figs 3 and 4, and dispenses with the use of pilot or auxiliary valves. Referring to sec-

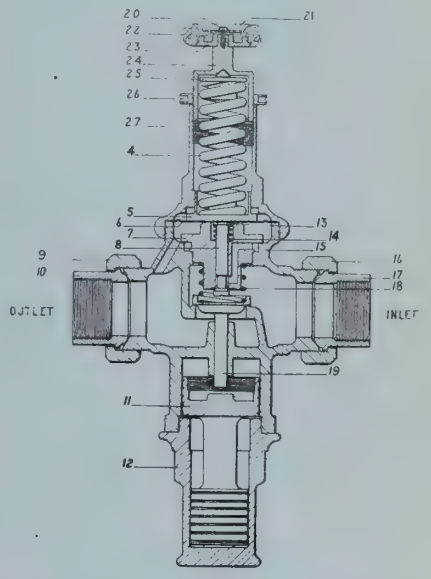


FIG. 2.—SECTIONAL VIEW OF "J.M.T." REDUCING VALVE SHOWING OPERATION OF MAIN AND AUXILIARY VALVES

tional view Fig. 4, it will be seen that a double beat valve is employed. The valve spindle extends upward through a packing gland to a yoke operated by lever and counterweight which tend to keep the valve open. The upper end of the yoke extends into a diaphragm chamber as shown, supporting a diaphragm whose upper side is connected by ⅜-in. pipe to the outlet main, and is thus exposed to the reduced pressure.

As the pressure on the outlet builds up to the desired point, the diaphragm is subjected to increased pressure, which finally overcomes the counterweight and commences to close the valve and reduce the flow of steam to the required amount. An increase of the outlet pressure about that adjusted for will close

the valve entirely and a drop will allow it to open more.

The Chaplin-Fulton Mfg. Co., Pittsburgh, make this valve in from 3-in. to



FIG. 3.—EXTERIOR VIEW OF FULTON REDUCING VALVE SHOWING COUNTERWEIGHT, LEVER, AND CONNECTION TO OUTLET MAIN

12-in. sizes, while below 3-in. the lever and weight are replaced by a long coil spring, which, with the diaphragm, is arranged below the valve body, the outlet pressure being conveyed to the upper side of the diaphragm directly through the body casting. The lever on the large sizes is balanced on a knife-edge fulcrum and supports the valve stem by means of a toggle connection which reduces friction and insures quick response to the slightest change of load.

Ohio Brass Pressure Regulating Valve

All of the several types of this valve operate on the same principle, employing a single seated main valve, and dispensing with weights, dashpots or pistons. It is operated by controlling the relation of pressures on the two sides of a metallic diaphragm, which is attached to the stem of the main valve. The control of these pressures is accomplished by a small controlling valve, which in turn is operated by the service pressure acting on one side of a small metallic controlling diaphragm against a controlling spring on the other side of the diaphragm. The operating and controlling diaphragms are both metallic and their movement is restricted within their elastic limit to avoid any danger of permanent distortion, the difference in pressure between the upper and lower sides of the operating diaphragm is never greater than about 15 lbs., and ordinarily is maintained at about 10 lbs.

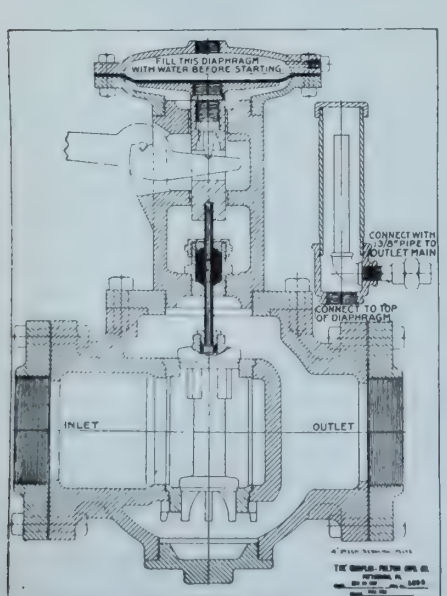


FIG. 4. SECTION OF FULTON REDUCING VALVE SHOWING DIAPHRAGM AND KNIFE EDGE CONNECTION TO COUNTERWEIGHT LEVER.

The type F valve illustrated in Fig. 5, is adapted to pressure from 0 to 15 lbs., 5 to 20 lbs, and 25 to 100 lbs., in sizes from ½-in. to 2-in. When high pressure steam enters the valve body at A, it passes up between the stem of the main valve 13, and guide nut 15 to the chamber E below operating diaphragm 19, and at the same time obtains access to the upper side D of the diaphragm through the internal ports C in the stem of the main valve. Thence it passes by way of passage F and external pipe 23 to controlling valve 25, which is held open by the upward pressure of adjusting spring 30, and thus allows the steam from the upper space D to pass right through to the low pressure side B of the main valve.

The difference in pressure between the upper and lower sides of the operating diaphragm forces the diaphragm upward compressing spring 14, and opening main valve to allow passage of steam to outlet. As the low pressure builds up, it acts against adjusting spring 30, through controlling diaphragm 27, so that controlling valve 25 closes when the reduced pressure is reached.

The closing of this valve prevents any further flow of steam through passage from the upper side of the operating diaphragm, so that the pressures on each side of it equalize and allow spring 14 to close the main valve. Adjusting spring 30 allows the controlling valve to close at any desired pressure with its range of adjustment; in actual operation, of course, the controlling valve does not close completely, but alters its position according to the flow of steam through the outlet—when the latter increases, the drop of pressure allows diaphragm 27 to rise so that the pressure in space D above the large diaphragm is reduced and the main valve allowed to open up more due to the greater difference of pressure between the two sides. The reverse action takes place when the outlet flow is reduced and the reduced pressure rises, the main valve floating and adjusting its opening continuously to the demands for steam on the reduced pressure side.

This valve is made by the Ohio Brass Co., Mansfield, O., who embody the same principle in type G valve, sizes 2½ in. to 4 in., which has a balanced main valve and other changes demanded by the increased capacity.

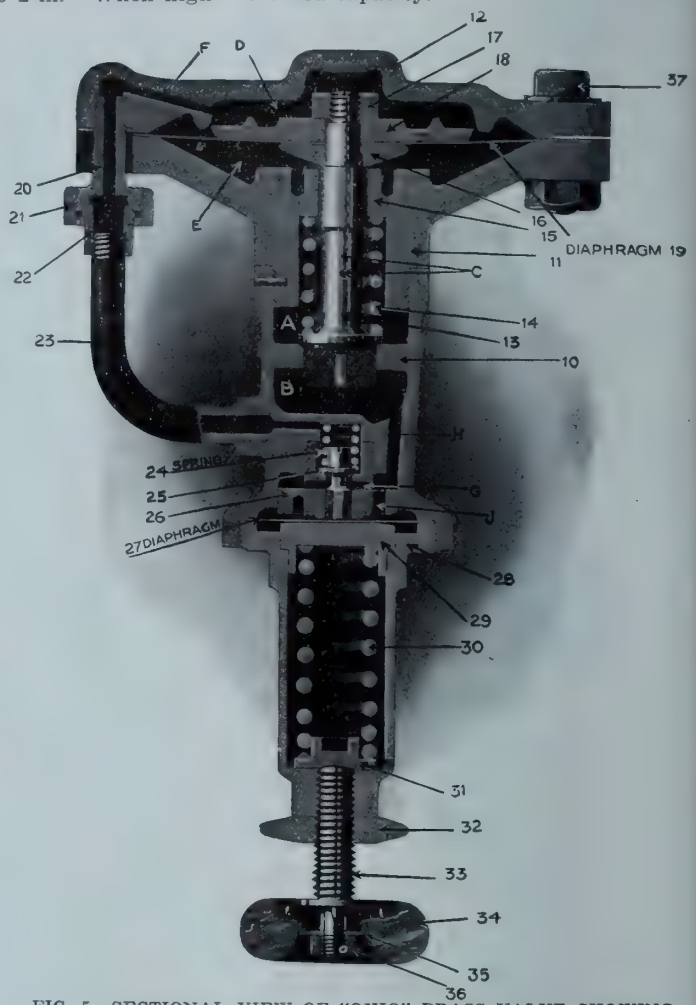


FIG. 5. SECTIONAL VIEW OF "OHIO" BRASS VALVE SHOWING LOCATION OF PARTS.

During a hot march in Palestine a sturdy Scotch soldier, six feet in height and proportionately broad, found himself side by side with a bumptious little Englishman, who was five feet nothing.

It was a hot day and the Scot was greatly troubled with the midges. They buzzed around him all the time, while the little Englishman seemed to be immune.

"The midges don't trouble me!" said the little man triumphantly. "I wonder why?"

The Scot looked down from his superior height.

"I daur say," he replied, "it's because they havena' noticed ye yet!"

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VOL. XII. MARCH 1, 1918 No. 5

A PROGRESSIVE MEASURE

ONE of the greatest drawbacks of this war so far has been the lack of common technical knowledge, not only in the worker, but in the men in higher positions.

How can a business be successfully handled, from an efficiency standpoint, if the heads of concerns in charge of men have not at least received some slight knowledge of the principles involved in mechanics? When all is boiled down, the technically trained man is head and shoulders over the average business man, providing that he has had a fair business training as well. Such being the case, the bylaw just passed by the Quebec Legislature will be of inestimable value to the people of the province of Quebec.

By this special law the board of direction is entitled to issue bonds, guaranteed by the province, to the extent of $150,000, for the erection and equipment of a technical school at Three Rivers, the province providing a yearly appropriation of $10,000 for its maintenance and, by agreement, the city of Three Rivers furnishing the same amount. Two representatives appointed by the city of Three Rivers and three by the Lieutenant-Governor-in-Council, and the principal of the school, will constitute the board of direction. The term of appointment is three years, without remuneration. The professors' staff will be appointed by the provincial secretary. The erection of this school, which will be situated in the heart of the city, has been zealously promoted by the Hon. J. A. Tessier, Mayor of Three Rivers and Minister of Highways, who has been a consistent advocate of any progressive idea for the development of industry.

FROZEN WATER PIPES

THE recent severe spell of cold weather has at least accomplished two things. It has given sanitary engineers a lot of work, which in more ways than one was not wanted, on account of the shortage of men. The other is that the meter question is being discussed again, but only discussed, we regret to say.

The fact remains that no water pipe will freeze if proper precautions are taken when the pipes are installed on the one hand, and if homes and buildings are properly constructed and made less difficult to heat on the other.

It seems ridiculous to expect that water pipes will not freeze if exposed, or if placed in locations that are not heated properly, and all this is brought about because the public will "take a chance"—will insist upon taking the lowest figure submitted for a sanitary system of plumbing. All of which is responsible for a big waste of water.

If a meter system were in force, the places in which they were installed would simply have to be heated, or it also would freeze. Then again as we have stated many times, more attention would be given to the quality of goods used that would not be water wasters. High-grade bibbs and W.C. tank outfits would be oftener the rule than the exception, and the sanitary engineer would no longer be blamed for the cheap and worthless fittings which are now so often made to duty in place of those of good workmanship.

VALUE OF THE TRADE PRESS

FOR some occult reason many manufacturers and many retailers fail to recognize the immense advantages to be derived from the Trade Press. We are glad to notice that Dr. Brownsdon, at the meeting of the Birmingham Section of the Institute of Metals, England, dealt with the fallacious assertion that no means exist at present for the dissemination of scientific knowledge among manufacturers. The Institute of Metals itself, he pointed out, existed for the purpose, and he urged that if manufacturers have new and valuable processes they wish to disclose they should do so through the columns of journals of good standing circulating in the industrial centres.

We hope this advice will not fall upon deaf ears. The importance of the Trade Press in these countries has never been fully realized. There has certainly been a more intelligent attitude with regard to the matter in recent years, but until the possibilities and the influence for good of the Trade Press are fully realized we fear we shall always lag behind those countries in which the Trade Press receives that recognition which it deserves. The manufacturer or dealer who fails to keep in touch with his trade press is like the medical man who ignores his medical journals. In the latter case the patients will suffer through the antiquated methods of the doctor, and in the former the clients of the careless member will soon find themselves very much handicapped.

"Knowledge is power," and no man knows so much that he cannot add to his knowledge. For the post-graduate in trade the Trade Press is essential to success.

The Economical Use of Soft Coal for Heating Houses

How to Get Maximum Heat With Minimum Consumption of Fuel — Correct Method of Coking—Hints on Chimney Construction—Useful Talking Points For the Sanitary Engineer

From the "Heating and Ventilating Magazine."

Draft Control for Illinois Coal

In order to operate any system of heater drafts successfully, especially with Illinois soft coal with which the circular is chiefly concerned, certain fundamental facts must be understood.

Due to the suction or draft action produced by a good chimney there is a constant tendency for air to enter any opening into the ash pit, combustion chamber, or smoke pipe of a house heater. It is, therefore, necessary to have all such openings controlled by tight-fitting dampers.

Air must be supplied in varying quantities, ranging through wide limits, in order to burn the fuel economically. With Illinois coal this variation in amount of air required is large and requires careful attention. It is greatest soon after firing, from which time it should be gradually decreased until the next charge is fired.

Air may be supplied either above (through fire door, Fig. 3, or through special slots or ports) or below (through ash pit door, Fig. 3) the burning fuel bed, and sometimes both above and below the bed. Immediately after firing soft coal, when the most air is needed, some air must enter above the fuel bed in order to burn the large amount of volatile matter given off from the fresh or "green" fuel charge and to provide sufficient oxygen to insure the burning of the combustible carbon gases given off from the fuel bed. Failure to supply air for this purpose will result in a considerable loss or waste of heat. As soon as this gaseous matter is burned off (the fresh fuel will have become more or less bright on top by this time) the overdraft through the fire door should be partly closed and the ash-pit damper left partly open. In mild weather both the ash-pit damper and the overdraft should be closed to prevent the coked fuel now left in the fire from burning out too quickly.

In case the fire must be checked still further, as is true for most of the heating season, the check damper (Fig. 3) in the smoke pipe must be opened in order to decrease the draft or suction action of the chimney by admitting cold air directly into the flue. This is the case when the fire is to be carried overnight without burning out, but there should be no attempt to "hold" a fire in this way unless there is a good bed of fairly well coked fuel already in the fire pot. Always let a fresh fuel charge burn up somewhat, with overdrafts at fire

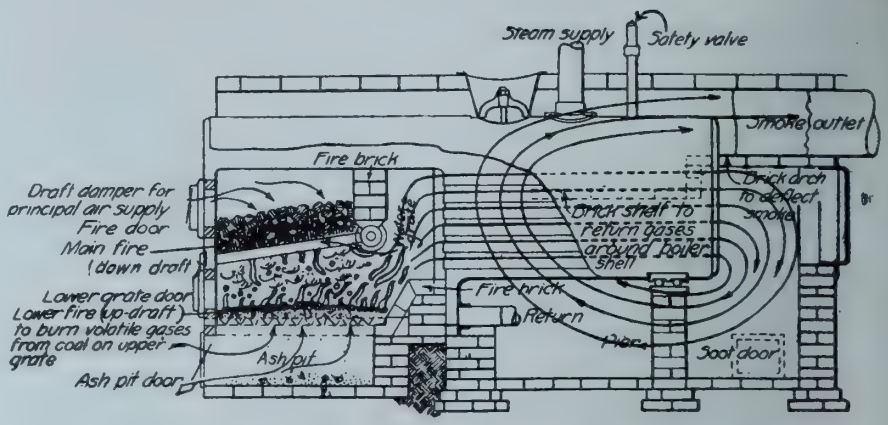


FIG. 5—TYPICAL DOWN-DRAFT BOILER FOR BURNING COAL WITHOUT SMOKE.

level open, before attempting to carry it for a considerable period with an open check-damper.

In order to promote economy, fire at fairly regular intervals, and put on comparatively small charges of coal frequently rather than large charges at much longer intervals. It is recognized that infrequent firing of large quantities of coal may be the more convenient method, but such convenience can, with the ordinary heater, be obtained only at the sacrifice of economy. Large charges of coal and infrequent firing will increase the chimney losses due to the production of unburned gases just after firing.

Employ the coking method of firing (Figs. 7 and 8) in so far as possible—that is, spread the fresh coal upon a portion of the fire bed only, leaving a portion of the fire glowing brightly (Fig. 7) so that the gases which rise from the freshly-fired coal may be quickly ignited. As soon as the fresh coal has been coked it should be spread out over the entire fuel bed (Fig. 8). It will then burn as a bright fire without further smoke (Fig. 9).

Those heaters which have fire-pots sufficiently large to permit the effective use of the coking method of firing by depositing considerable quantities of coal on one part of the fire bed while the other is glowing and carrying on the combustion can be most economically employed for house heating. Many house heaters have fire-pots which are too small to make possible the use of the coking method and its economy.

Keep a fairly thick fire bed, with the

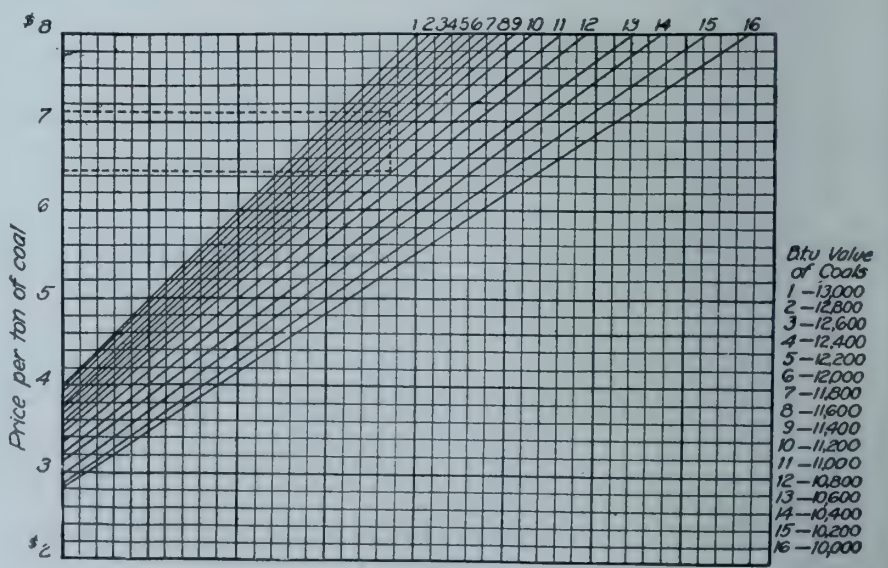


FIG. 6—THEORETICAL VALUE OF COALS OF DIFFERENT HEATING VALUES AT VARIOUS PRICES PER TON

surface of the fire well up in the heater. This keeps the fire in the best condition to radiate heat to the heat-absorbing surfaces and prevents the loss of coal to the ash pit. More ashes can, of course, be carried in the lower part of the fuel bed (Fig. 3) during mild than during

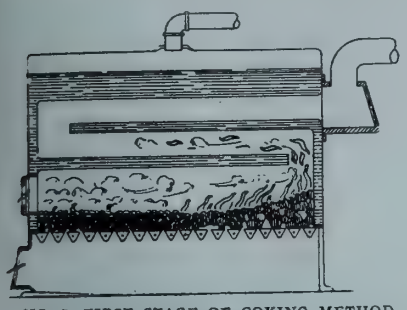


FIG. 7—FIRST STAGE OF COKING METHOD OF FIRING.

cold weather. Do not poke or stir the fire, as this is likely to produce clinkers and to cause greater losses both to the ash pit and to the chimney. For the same reason excessive shaking should be avoided. If clinkers are produced, they should be removed with as little disturbance of the fire bed as possible. Keep the ashes away from the under side of the grate. Their presence may prevent the inflow of sufficient air, or may deflect the air admitted through a part of the fire bed only. This condition not only interferes with the proper com-

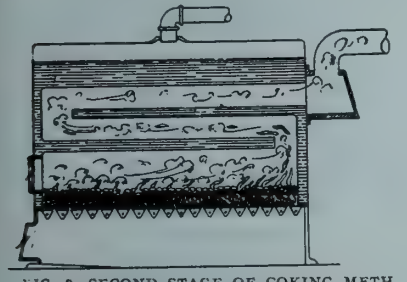


FIG. 8—SECOND STAGE OF COKING METHOD OF FIRING, WITH NEWLY-COKED FUEL SPREAD OVER ENTIRE FUEL BED.

bustion of the coal, but may also result in burned-out grates.

Care of the Heater in Service

The heater while in service should be kept in good repair throughout. Soot and ashes in the flues or gas passages prevent the heat from passing to the water, steam or air which is to be heated. Flues should be thoroughly cleaned at regular intervals. Some heaters should be cleaned every day, while in general a cleaning about once a week is

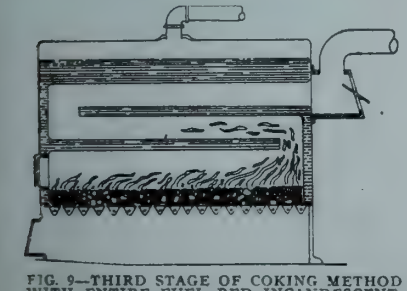


FIG. 9—THIRD STAGE OF COKING METHOD WITH ENTIRE FUEL BED INCANDESCENT.

sufficient. Soot and ashes upon the heating surfaces not only prevent the passage of heat, but may so clog the flues as to interfere with the draft action and thus make satisfactory operation of the heater impossible.

Why Smoke is an Indication of Losses

While tests have shown that the actual heat value contained in smoky discharges from the chimney is not very much greater than that contained in discharges which are not smoky, the presence of smoke usually indicates careless methods of firing or improper regulation of dampers with their attendant losses and wastes. If your chimney smokes continually or too freely, you may be sure that unnecessary losses are taking place.

TORONTO S. & H. ENGINEERS AT BUFFALO

(Continued from page 13.)

On behalf of the Toronto Society of Domestic Sanitary and Heating Engineers, Secretary Frankland presented to the Buffalo Master Plumbers' Association a token of good friendship in a very nice loving cup, suitably engraved for this auspicious occasion.

Mr. John Kavany replied on behalf of President Dechert and the Buffalo Association, thanking the Toronto Society for the memento of their visit, and assured the Toronto visitors that it would always remind them of the many good times that had been the fortune of the two associations to spend together in the past, and to look forward to many repetitions of the same in the future.

Upon the completion of business, all hands participated in a Dutch lunch, served in the hall.

Lager beer, wieners, pretzels, salads, sandwiches, cake and a bottle of milk for Tiny were in abundance, and while all hands joined in partaking of same, the party was besprinkled with red, white and blue confetti and entwined together in the same colored ribbon.

At one a.m. the party broke up and all hands wended their way to their homes and hotel, to prepare themselves for the good things provided for the morrow. John Cracknell became detached from the party on the way back to the hotel, and from all accounts and the evidence secured as to his whereabouts, it is believed that he got lost in the colored section of the city.

Dinner Friday Noon

George Clapperton left for home at noon, and placed the care of the party in the hands of Kenny J. Allison. A. F. Passmore was seen busily engaged in one of the department stores in the company of—well never mind. He was buying music to take home and departed for Rochester during the afternoon, while ten of the party, under the guidance and fathering of Kennedy J. Allison repaired to the Statler restaurant, in the Ellicott Square Building, where they gathered about the round table, and with the assistance of a most motherly young waitress got outside of everything on the bill of fare, in fact so taken up were certain members of the party with the waitress that they returned for further replenishment on later occasions during their stay to the same spot.

The famous "push-on" became a feature of Stalter Restaurant service—at these sittings, and from now on, will always be included in the menu at this particular table. Harry Hicks was the fortunate one to receive those but was deprived from enjoying them, through the grabbing methods used by K. J. Allison and G. F. Frankland, who quickly demolished everything in the nature of "push-ons." Buns were a failing of K. B. Allison and Roy Belyea, also Edwin Newsome, in fact these three finished up tie for the honors of displacing the largest number of buns, and to the sorrow of others, who went bunless.

Theatre Party

Friday afternoon the Toronto visitors were entertained to a theatre party at



LOVING CUP PRESENTED TO BUFFALO M.P. ASSN. BY THE TORONTO SOCIETY.

the Gaiety Theatre, all hands being seated together up front, where no chance of missing anything was assured by director McGamwell.

At the finish of the show, the Buffalo boys escorted the Toronto party to the Hotel Niagara, where all joined together and partook of a most sumptous banquet. Music was provided throughout the eats and drinks by a special orchestra secured for the occasion.

A Trip to Jail

At ten a.m. Saturday morning those Toronto boys who had not left on Friday gathered in the office of assistant secretary Fred Fleishauer of the Buffalo Association, from where he guided them to the county building to meet Sheriff Fred A. Bradley of Erie county, a master plumber of Buffalo.

The party was taken in charge by Sheriff Bradley and escorted to Erie

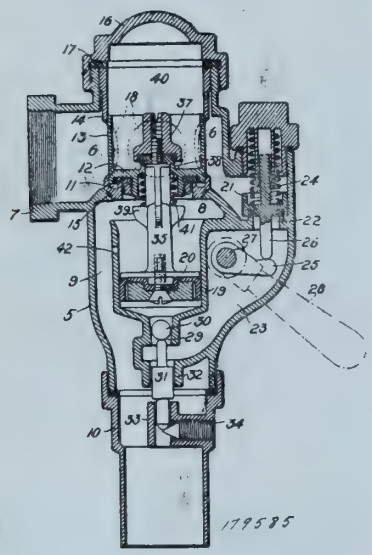
(Continued on page 28.)

New Canadian Patents

No. 179,585.

The Phillips Flushing Tank Company, Portland, Maine, assignee of Charles Henry Phillips, Malden, Massachusetts, both in the U.S.A., 2nd October, 1917; 6 years. Filed 13th July, 1917. Receipt No. 282,215.

Claim.—1. In a flushing valve having in combination a main valve member, a dashpot connected with said valve member for causing its opening movement and retarding its closing movement, the dashpot having an opening for the inflow and escape of water, a passage connected with said opening and also provided with a restricted escape opening, manually operable means for admitting water into the passage at a rate faster



179,585. Flushing Valve.

than it can escape through said escape opening, whereby the water is caused to fill the dashpot and open the main valve member, and a check valve controlling the opening in the dashpot and movable, by the inflow of water to a comparatively open position, and by the outflow of water, to a more nearly, but not entirely, closed position.

2. A flushing valve having in combination a body provided with a valve seat and with inlet and outlet passages, a main valve co-operating with said seat and arranged to open against the direction of flow, a hydraulic device connected with the main valve and adapted to act as a motor to move the valve from its seat, and as a dashpot to retard the return of the valve to its seat, and manually controlled means for admitting water to the hydraulic device from the inlet to cause it to act as a motor, the cylinder of the hydraulic device being provided with an escape opening located in position to be uncovered by the piston near the completion of its operative stroke as a motor, said opening communicating with the outlet passage.

3. In a flushing valve, a hydraulic motor and dashpot for controlling the valve proper, provided with a tapering inlet and outlet passage, a combined check valve and regulating valve in the form of a ball movable in said passage, a support for the ball extending into engagement therewith when the ball is in position to check the outflow through the opening, and manually operable means for moving the support to adjust the position in which the ball is arrested.

4. A flushing valve having in combination a signal seated balanced main valve, a relief valve seated in the main valve, a hydraulic motor and dashpot connected with the relief valve and the main valve to open them in sequence, and a spring tending to move the relief valve to closed position with respect to the main valve and in opposition to the action of the motor.

5. A flushing valve having in combination a main valve, a dashpot for producing resistance to the closing movement of the main valve, and means for subjecting the main valve to a closing pressure regulated automatically to a predetermined amount regardless of variations in the pressure in the water supply.

6. A flushing valve having in combination a single seated balanced main valve, a dashpot for producing resistance to the closing movement of the main valve, and a spring controlled relief valve constructed and arranged to relieve automatically any valve closing pressure upon the main valve in excess of a predetermined amount.

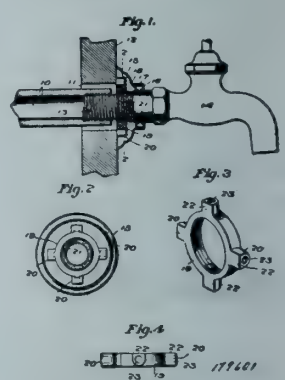
No. 179,601.

Phillip Mueller and Anton C. Schuermann, co-inventors, both of Decatur, Illinois, U.S.A., 9th October, 1917; 6 years. Filed 13th August, 1917. Receipt No. 283,195.

Claim.—1. In a wall fitting, a faucet having a shank engaging through an opening in a wall and adapted for attachment to a supply pipe, a canopy movable longitudinally on the shank for engagement against the wall to cover the opening, and a retaining device adjustably secured on said shank within the canopy for engagement with said wall to hold the faucet in position, said device having adjusting means on its periphery adjacent to its inner end to permit access thereto between the wall and the canopy upon the slight separation of the latter from the wall.

2. In a wall fitting, a faucet having a shank for engagement through an opening in a wall and adapted for attachment to a supply pipe, said shank having relatively fine threads adjacent to its inner end, a collar internally threaded for engagement with said fine threads of the shank, said collar having radially extending lugs adapted for engagement against said wall to hold the shank firmly in place, said lugs having tool receiving openings in their outer ends to increase the radial purchase of the tool on the collar, and a canopy slidable on said shank adapted to inclose said collar and the lugs carried thereby.

3. In a fitting of the class described, the combination with a faucet having a shank adapted to pass through a wall opening and engage a supply pipe, of a collar adjustably mounted on the faucet shank and adapted to bear against the retaining wall to clamp the fitting firmly in place, and a canopy of thin bendable metal disconnected from said collar and slidably mounted on the faucet shank and having an extended bearing thereon, said bearing being adapted to seat against the wall surface, inclose said collar and opening, and adjust itself by body distortion to the angular position of the faucet relative to the wall.



No. 179,601.
Wall Fitting for Cocks.

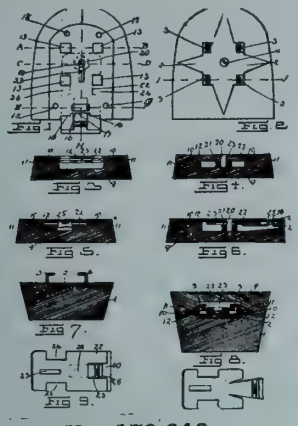
4. In a wall fitting, the combination with a faucet having a shank engaging through an opening in a wall and adapted for attachment to a supply pipe, and a canopy longitudinally movable upon said shank adapted to engage the wall over said opening, of a retaining collar adjustably fixed on the shank separately and independently of said canopy and located within the canopy for binding engagement against said wall to hold the faucet in place, said collar having a convex or spherical seat for engagement with the edge of the opening in the wall to permit the collar to adjust itself over the opening upon angular displacement of the faucet relative to the wall.

No. 179,646.

Philip Mueller, Decatur, Illinois, U.S.A., 9th October, 1917; 6 years. Filed 3rd August, 1917. Receipt No. 282,865.

Claim.—1. A pipe coupling comprising a head having a curved rib thereon

formed of a series of separated elongated sections, a relatively soft pipe provided with a flange to bear against said



No. 179,646.

Lead Pipe Connection.

head, and a coupling nut to draw said head and soft pipe together.

2. A pipe coupling comprising a head having a flat abutting face, a spiral rib on the flat face of the head, a relatively soft pipe, and a coupling nut on the head engaging the pipe and adapted to be tighted on said head whereby to mould the end of the soft pipe about said rib.

3. A coupling comprising a head having an abutting face, spirally arranged stop shoulders on said abutting face, a relatively soft pipe, and a connecting member binding said soft pipe to said head whereby to embed said stop shoulders into said soft pipe.

4. A pipe coupling comprising a head having a curved rib thereon formed of a series of circularly spaced, radially offset sections, a relatively soft pipe provided with a flange to bear against said head, and a coupling nut to draw said head and soft pipe together.

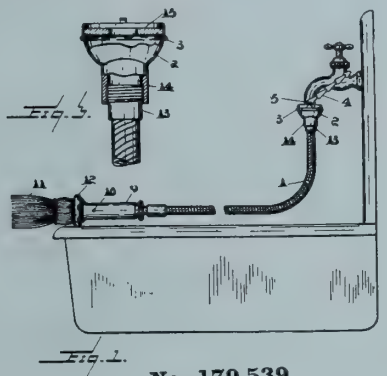
No. 179,539.

Edgar Beaumont Jarvis, Toronto, Ontario, Canada, 2nd October, 1917; 6 years. Filed 28th February, 1917. Receipt No. 276,323.

Claim.—1. A fountain brush for the purpose described comprising a metal tube with a closed end and perforated laterally adjacent the end, a wooden sleeve forming a handle and a brush head and surrounding the tube, the latter projecting at each end from the sleeve, bristles bound to and surrounding the sleeve adjacent the perforated end of the tube, and a flexible tube secured to the other end of the metal tube.

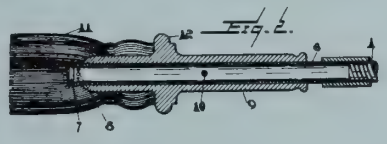
2. A fountain brush for the purpose described comprising a metal tube with a closed end and perforated laterally adjacent the end, a wooden sleeve forming a handle and a brush head and surrounding the tube, the latter projecting at each end from the sleeve, bristles bound to and surrounding the sleeve adjacent the perforated end of the tube, a collar integral with the sleeve against which the ends of the bristles abut, and a flexible tube secured to the other end of the metal tube.

3. A fountain brush for the purpose described comprising a metal tube with a closed end and perforated laterally adjacent the end, a wooden sleeve forming a handle and a brush head and surrounding the tube, the latter projecting at each end from the sleeve, bristles bound to and surrounding the sleeve adjacent the perforated end of the tube, the end of said sleeve being tapered to allow the bristles to close in towards the tube, and a flexible tube secured to the other end of the metal tube.



No. 179,539.

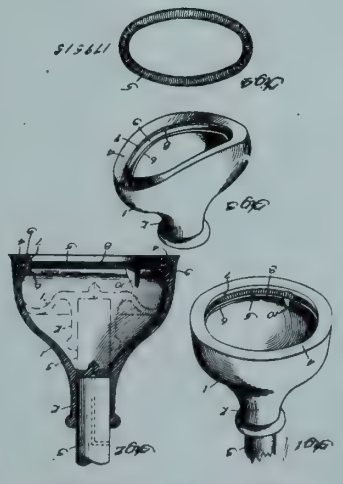
Fountain Brush for Washing Dishes.



No. 179,515.

Mandel Block, Chicago, Illinois, U.S.A., 2nd October, 1917; 6 years. Filed 26th July, 1917. Receipt No. 282,532.

Claim.—1. A force pump for plumbers having a dome-like body with an annular base, said body being of impervious resilient material, means for depressing the upper portion of the body, and an annular stiffening element for stiffening the base of said dome-like body, said stiffening element being also slightly expansible, whereby its diameter may be slightly varied.



179,515. Force Pump.

2. A device of the class described, consisting of a domelike rubber body, a handle at the top for collapsing it, and a helical spring bent to form a torus and being embedded in the base slightly above the extreme bottom, whereby there is a portion of rubber beneath the spring and separating the spring from the object upon which the device rests.

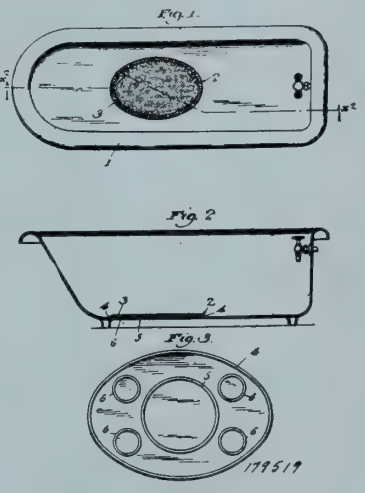
3. A plumber's force pump comprising a dome-like body of rubber, a handle for collapsing it, and a spring torus made from a wire helix, said body having an annular chamber formed in the base and communicating, through a slot, with the inside of the body, whereby the torus may be inserted or removed after the dome-like body has been formed.

No. 179,519.

Walter H. Clark, Akron, Ohio, U.S.A., 2nd October, 1917; 6 years. Filed 27th March, 1917. Receipt No. 277,599.

Claim.—1. A bath tub mat comprising a flexible resilient body having depending continuous resilient flanges at the periphery thereof adapted to engage the bottom of a bath tub and space the body therefrom, and a plurality of substantially circular flanges formed integral with and depending from the under face of the body and providing suction cups, all of said flanges having their lower edges located in the same plane.

2. A bath tub mat comprising a flexible resilient body having depending resilient continuous flanges at the periphery thereof and a circular flangt formed integral with the under face of the body approximately centrally thereof, and another circular flange formed integral with the body on the under face



179,519. Mat for Baths.

thereof, said flange in combination with the body providing suction cups, all of said flanges having their lower edges located in the same plane.

3. A bath tub mat comprising a flexible resilient body portion, a depending resilient flange formed integral with the body portion at the periphery thereof, a circular flange formed integral with the under face and body centrally thereof, said first-named flange being continuous, and suction cups formed integral with the body on the under face thereof, said cups having their open ends located in the same plane as the lower edge of the flange.

Market Conditions and Tendencies

Statements Regarding the Prices and Trend of Supplies.

THE MARKETS AT A GLANCE

PERHAPS of prime interest to the plumbing trade during the week is the sweeping regulation of the United States War Board requiring all exports to be licensed. This applies apparently to all raw materials and finished products. One of the big items to be affected is that of sheet steel. It is not known yet what effect this will have on Canadian industry for it remains to be seen with what liberality the United States authorities will allow exports into Canada.

An impending shortage of iron continues as reflected in the conditions in the Pittsburgh district. This may possibly affect the supplies of pig-iron coming into Canada, which finds extensive use in plumbing goods. Leading sellers are already booked within a small margin of their full output for the last half of the year and large requirements for companies engaged in war work remain uncovered as yet. Under these conditions the domestic consumer seems to stand small chance of having his wants supplied.

In the non-ferrous metals tin was in very active market during the time intervening since last issue. An advance of 8c to 10c per pound has been recorded. Further supplies of tin can only be brought forward from Great Britain under license. Stocks of tin in Canada are getting low and there is every prospect that an acute situation will develop in the not distant future. Products containing tin have consequently been in firm market, substantial advavnces having been recorded in solder. Another change to be recorded was a decline in flat rim sinks. There has been a fair amount of repair business for the plumbing trade, but it is somewhat early yet for new spring business to develop.

TORONTO, Feb. 26.—Interest has been centred around embargoes on products coming from the United States. These regulations are likely to touch intimately various branches of the plumbing trade. Indications of the probable trend of building during the coming spring and summer have not yet been manifested to any considerable extent. Manufacturers, however, are of the opinion that the building operations of Canada will be somewhere near the average of the past three years, namely, between $30,000,000 and $35,000,000. A reduction in the price of flat-rim sinks is a tendency that has been noted with interest in the plumbing trade.

Range Boilers May Be Further Restricted

RANGE BOILERS.—The sweeping regulation of the United States War Board requiring a license for all exports may further affect the manufacture of range boilers. An embargo on No. 10 gauge and heavier black sheets had the effect of keeping out the materials used in the ends of the boilers. With the possibility that the lighter gauge sheets will be allowed to come forward only under license there may be greater restriction of sheets used in body of boilers. Manufacturers await with interest developments in this respect. Prices held unchanged at the advances recorded in last issue.

	Standard	Extra Heavy
30-gallon range boilers	$14.00	$17.00
35-gallon	17.00	20.50
40-gallon	20.50	24.00
52-gallon	28.00	32.00
66-gallon	37.00	42.00
82-gallon	45.00	50.00
100-gallon	62.00	70.00

Decline In Price Of Flat Rim Sinks

ENAMELWARE.—A further decline has been made effective in two sizes of flat rim sinks. In size 14 x 20 inches the new price is $4.80, representing a decline of $1.05, while price of size 18 x 24 is $5, showing a reduction of $1.85 each. Other lines of enamelware hold unchanged. Manufacturers are not accepting booking orders at present, owing to the uncertainty with respect to obtaining raw material and in securing an adequate labor supply.

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Sinks, roll rim, 18 x 30 in., staple	16 80
Closets, oak tank and seat	22 00
Do., enamel iron or white vitro tank	23 75

Soil Pipe And Fittings Hold Steady

SOIL PIPE, FITTINGS.—The market for soil pipe and fittings is quiet at present, with light demand reported. Prices hold unchanged on various commodities.

SOIL PIPE FITTINGS.

Medium and extra heavy soil pipe, 6-inch and under	35%	2½%
8-inch soil pipe	....	30%
Medium and extra heavy fittings, and under	40%	2½%

C. I. PIPE FITTINGS.

Cast iron fittings	....	15%
Cast elbows, tees, etc.	....	15%
Plugs	25%	
Bushings	30%	33⅓%
Flange unions, standard	....	20%
Dart unions, ¼-inch to 2-inch	20%	25%
Do., 4½ in. and larger	....	15%
Nipples, up to 4-inch	....	45%
Do., 4½-inch and larger	....	40%
Do., running thread 4-in. and under	....	25%
Couplings, 4-in. and under	....	35%
Do., 4½ in. and larger	....	15%

MALLEABLE FITTINGS.

	Black	Galv.
Malleable Fittings, Class A, lb.	0 50	0 63
Do., Class B, lb. net	0 22	0 33
Do., Class C, lb. net	0 15	0 22

Oakum Demand Is Still Reported Light

OAKUM.—Market is quiet with demand for plumbers' oakum light. With the coming of spring an active demand for marine oakums is anticipated.

		Per 100 lbs.
Best American	....	$21.50
U.S. Navy unspun	....	20.75
Plumbers' spun	$8.50	10.00

Valves Continue An Active Feature

VALVES.—Manufacturers are still busy on various kinds of valves. Trade in these commodities has been very active for some months past. There is no sign of any falling off in trade. Makers are still running to capacity. Prices for various lines held unchanged.

	Discount off list
Ground work	50
Compression work, standard	52
High grade	45
Cushion work	46
Fuller work, standard	50
High grade	43
Basin cocks, No. 0 standard	46
Nos. 1 and 2	46
Bath cocks	53
Flatway stop and waste cocks, standard	53
High grade	50
Roundway stop and waste cocks, standard	53
High grade	50
Brass steam cocks, standard	Net
Globe, angle and check valves, standard	10
Do., removable seat	7½
Radiator valves, standard	15
Do., removable seat	10
Patent quick opening valves	35
Basin Cocks—	
No. 0 and 1, Fuller pattern	50
No. 0 and 1, compression	46
Midget	50
Globe, angle and check valves, medium pressure	30
Radiator valves, standard	30
Radiator valves, Jenkins disc	30
Radiator valves, quick opening	40

Pipe Prices Hold At Recent Advance

WROUGHT PIPE.—The market held unchanged at advance recorded in last issue. Manufacturers are face to face with a difficult situation in getting supplies of raw materials from the United States. The licensing system for exports adopted in that country will in all probability work out toward still further restricted supplies of pipe available for this market.

WROUGHT IRON PIPE

Effective Feb. 5, 1918.

Standard Buttweld—	Per 100 feet Black	Galvanized
⅛ in.	$ 6 00	$ 8 09
¼ in.	5 16	7 29
⅜ in.	5 16	7 29
½ in.	6 55	8 12
¾ in.	8 28	10 41
1 in.	12 24	15 39
1¼ in.	16 56	20 82
1½ in.	19 80	24 89
2 in.	26 64	33 49
2½ in.	42 71	53 53
3 in.	55 85	70 09
3½ in.	70 84	87 76
4 in.	83 93	104 10
Standard Lapweld —		
2 in.	29 60	36 08
2½ in.	44 46	54 70
3 in.	58 14	71 53
3½ in.	72 68	90 62
4 in.	86 11	107 37
4½ in.	97 79	122 56
5 in.	114 00	142 82
6 in.	147 80	185 28
7 in.	192 80	241 57
8 L in.	202 50	253 75
8 in.	233 30	292 32
9 in.	279 50	350 18
10 L in.	259 20	324 80
10 in.	333 70	418 18

Terms 2% 30 days, approved credit.
Prices—Ontario, Quebec and Maritime Provinces.

Copper Sheets Lower; Galvanized Weaker

SHEETS, PLATES.—Lower prices were quoted in some quarters on plain copper sheets, base price for 16 oz. and heavier being 35c in instance noted. Quotations range as high as 44c base. Competition for trade in this line has been instrumental in driving the price down. Galvanized sheets were in weaker market during the week, competition again in this instance being responsible for the weaker condition. Range of quotations, however, held unchanged. There is a fair demand for black and galvanized. Prices on black sheets were shaded downward from the high quotations of last week.

An uncertain situation has developed in the market for black and galvanized sheets. Various interpretations are placed on the situation as it exists in the United States. The recent order by the United States Government which prohibited export of sheets to foreign countries other than Canada except under license has been taken by some importers as applying to Canada as well. Within the past few days there has been a further order prohibiting shipment of all goods from Canada into the United States in value over $100. This is also held to apply to goods coming from the United States into Canada. This would apply to black sheets and galvanized sheets as well as all other commodities. However, this is considered only a temporary measure to relieve the freight situation. From information which we have been able to gather up to the present time it would appear the situation is as follows: Embargo applies to shipment of all sheet steel from United States to foreign countries other than Canada. At present time there is a temporary freight embargo on all goods coming from United States into Canada except in quantities the value of which is $100 and less.

BLACK SHEETS—	Per 100 lbs.		
10 gauge	$	$10 00	$12 00
12 gauge	7 55	10 10	11 60
14 gauge	7 45	8 40	9 10
16 gauge	7 50	8 50	9 20
18 20 gauge	7 30	8 05	8 30
22-24 gauge	7 35	8 10	8 35
26 gauge	7 40	8 15	8 40
28 gauge	7 50	8 25	8 50
3-16-inch plate	10 25	....	....
¼-inch boiler plate	10 00	....	....
GALVANIZED SHEETS—			
10¾ oz.		$9 50	$10 50
U.S. 28		9 20	10 20
U.S. 26		8 90	9 90
22 and 24		8 75	9 75
18 and 20		8 60	9 60
16		8 45	9 45
14		8 35	9 35

Solder Makes An Advance 1c to 2c Pound

LEAD AND ZINC PRODUCTS.—Owing to the very strong situation in the tin market advances have been recorded in the price of solder, ranging from 1c to 2c per pound. Guaranteed solder is now quoted at a range of 46c to 47c per pound, strictly at 42½c to 44c pound, commercial at 39c to 40c, wiping solder at 39c and solder wire at 46¾c to 50¾c per pound. Lead sheets and other lead products held unchanged.

LEAD AND ZINC PRODUCTS.—		
Lead pipe, lb.	$ 0 14	$ ....
Lead waste pipe, lb.	0 15	....
Lead traps and bends	Net list	
Lead wool, lb.		0 16
Lead sheets, 3 to 3½ lbs. sq. ft., lb.		0 13¼
Lead sheets, 4 to 8 lbs. sq. ft.		0 12½
Cut sheets, ¾c lb. extra, and cut sheets to size, 1c lb. extra.		
Solder, guaranteed, lb.	0 46	0 47
Solder, strictly, lb.	0 42	0 44
Solder, commercial, lb.	0 39	0 40
Solder, wiping, lb.	....	0 39
Solder, wire, lb.	0 46¾	0 50¾
Zinc sheets, per lb.	0 26	....

More Boiler Tubes Reported On Way

BOILER TUBES.—Importers of boiler tubes report existing stocks are within very narrow compass but expect a shipment in the near future. Permits have been granted by the Washington authorities. These tubes can only be sold in Canada after permit has been granted by the War Trade Board. Prices held unchanged.

Toronto—	Per 100 feet Cold drawn	Lapweld
1 inch	$36 00	$ ....
1¼ inch	40 00	....
1½ inch	43 00	36 00
1¾ inch	43 00	36 00
2 inch	50 00	36 00
2¼ inch	53 00	38 50
2½ inch	55 00	42 00
3 inch	64 00	50 00
3¼ inch	....	58 00
3½ inch	77 00	60 00
4 inch	90 00	75 00

Old Materials Offered But Shipment Backward

OLD MATERIALS. — Sellers of old materials, especially old iron and kindred commodities, have shown a disposition to sell during the week but the railroad situation has been against movement of freight. In consequence business has been light. Prices held unchanged.

Tea lead	$ 0 04½	....
Heavy lead pipe	0 07	0 07½
Yellow brass	0 12	0 13
Red brass	....	0 22
Light brass	....	0 09½
Heavy zinc	0 06	0 06½
Heavy copper	0 22	0 22½
Stove plate, per ton	17 00	18 00
Old cast iron, per ton	25 00	26 00

Ingot Tin Advances 6c to 8c Pound In Week

INGOT METALS.—A very active market maintained for ingot tin during the week. Demand for other ingot metals is quiet with prices holding steady, except in the instance of tin.

COPPER.—With a clearing of the transportation lines to a certain extent in the United States there were better deliveries. The situation is one of steadiness and will remain so until matter of price revision again comes up in June. Locally prices were quoted on basis of 30c to 32c per pound for casting copper.

TIN.—There was an exceedingly active market locally for ingot tin and prices went soaring to the extent of 6c to 8c per pound, making quotations from 86c to 90c. Supplies of tin in the local market are reported very light with no prospect of getting additional supplies in the near future as the British Government is not letting any stocks out for the present.

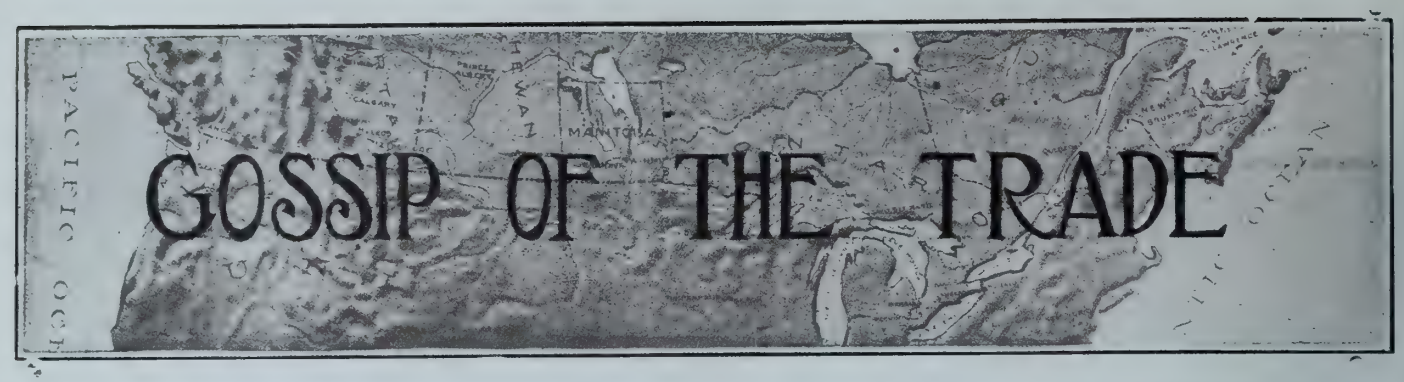
SPELTER.—In the primary markets supplies of spelter are more than sufficient for demands of trade. Locally conditions were quiet with prices unchanged at 9¾ to 10½c per pound.

LEAD.—Primary market held steady but firm during the week. There is little activity at present time. A buying movement would in all probability send prices higher at primary points. Locally quotations were unchanged at 9¼c to 9½c per pound.

ANTIMONY.—There was very little activity in this commodity in the local market during the week. Prices were unchanged at 16c to 18c per pound.

ALUMINUM.—There is a better inquiry for aluminum in primary markets. Locally conditions were steady with prices unchanged at 60c per pound.

PIG IRON.—Deliveries of raw materials and coke to the smelting furnaces is still the big problem for producers. Sufficient has been reaching the producers to keep them running but arrivals of raw materials are of a hand-to-mouth nature. Prices on foundry iron were unchanged at $49.50 per ton.



TRADE NOTES

Sorel, Que.—Hector Dallaire, sanitary engineer, has been burnt out.

Montreal.—Racette & Gaudette, sanitary engineers, have dissolved partnership.

INCORPORATIONS

Lindsay, Ont.—Lindsay Coal Co., Ltd., has been incorporated with a capital of $30,000 to manufacture and deal in coal, wood, lime, plaster of Paris, brick, tile, terra cotta, whiting, concrete and cement of all kinds.

PERSONAL

Captain Wm. M. Everall, A.M.Can.Soc. C.E., who has seen more than two years of service in France, has been appointed assistant engineer with the Dominion Public Works Department at Victoria, B.C. Previous to joining the army he was Dominion engineer at Port Arthur, Ont.

WORKS CONTEMPLATED

Daysland, Alta.—Provincial Government contemplate construction of two drainage systems.

Brandon, Man.—City Council contemplate the purchase of waterworks equipment costing $33,000.

Fredericton, N.B.—City Council is contemplating installing more powerful pumps and water meters for the waterworks system.

Brandon, Man.—City Council contemplate the construction of a water main costing $60,000, First Street, Pacific Avenue to Asylum.

TRADE GOSSIP

Vancouver, B.C.—City engineer has recommended the installation of water meters with a view to enforcing water conservation.

Chatham, Ont.—The Canadian Brass Co., of Galt, Ont., have the contract for needed brass goods for the year for the waterworks department.

Hamilton, Ont.—Estimates of the Works Committee of the Board of Control include $29.000 for a sewer on King West, $3,500 for one on Main West, and $12,000 for one on Gage Avenue.

Fredericton, N.B.—The report of the civic Board of Health recommends the extension of the water and sewage system to serve Wilmot's Alley and the Aberdeen Street extension. It is the intention of the board to compel owners early next spring to make sewer connections.

LONDON EXCHANGE ELECTS OFFICERS

At the annual meeting of the London Builders' Exchange, officers for 1918 were elected as follows: President, Harry Hayman; first vice-president, L. A. Ross; second vice-president, Ed. Gerry; treasurer, Thos. A. Jones; board of directors, Messrs. A. C. Nobbs, E. R. Dennis, Thos. Beer, Ben Noble, T. R. Wright; auditors, Messrs. Pace and James Whitaker. Messrs. Moran, Nobbs, Hayman, Noble and Gould were chosen as delegates to the provincial convention which is to be held in Galt next June.

CENTRAL HEATING SYSTEM FOR OWEN SOUND

A scheme for the establishment of a central heating system in the business section of Owen Sound, Ont., is under discussion. It is proposed to utilize the battery of boilers belonging to the old municipal electric power station which was replaced by the hydro-electric installation at Eugenia Falls. The plant is centrally located and it is believed that it could supply ample heat to every building in the business district and also that the saving in fuel alone in one year would more than pay the cost of installing the system in this section.

CLEARING SEWER PIPES

Bradford, England, has a sewer five miles long, with a drop of 70 feet in distance. The grade is not uniform. As the sewage is loaded with heavy, solid matter, the flow was not what is should have been. The city did not want to resort to pumping because of the expense. One of the city engineers hit upon the idea of using compressed air at a pressure of 80 pounds and discharging it at regular intervals into the sewer. The plan was carried out with great success. It has been done for some time now without a recurrence of the difficulty.

MONTREAL MASTER PLUMBERS ELECT NEW OFFICERS

The Montreal Plumbers' Association elected the following officers at the annual meeting, and these hold office for the present year:—President, James Griffin; First Vice-President, James Laurier; Second Vice-President, W. R. J. Hughes; chairman of Sanitary Committee, P. C. Ogilvie; chairman of Arbitration Committee, Jas. Ballantyne; chairman of Legislative Committee, T. Latourelle; chairman of Apprentice Committee, Jos. Thileault; chairman of Price List Committee, John A. Gordon.

At a meeting of the Montreal Plumbers' Association on Wednesday, Feb. 13, some interest was shown in the new Quebec Bill regarding the heating of public buildings, and this was referred to the Legislative Committee, with request that a report be submitted at the next regular meeting.

Annual Convention Postponed

At a meeting of the executive of the Canadian Society of Domestic Sanitary and Heating Engineers, held recently at the establishment of John Watson, 4145 St. Catherine Street W., Montreal, secretary-treasurer of the society, it was decided to postpone till June, 1919, the annual convention, which was to have been held in June next.

This decision has been taken after consideration of the present state of the war and business and on demand made by many officers from Montreal. The executive hopes that each officer of the different branches will be kind enough to remain in charge for this year, and that he will devote all his energies to the future benefit of the association.

(Signed) A CHARETTE, President.
J. WATSON, Sec.-Treas.

CONTRACTS AWARDED

Westmount, Que.—W. G. Bailey, 115 Bleury Street, has plumbing and heating contract in connection with the rebuilding of the ice plant for the Ice Manufacturing Co., Ltd.

Montreal, Que.—L. E. Moulton & Co., Ltd., have plumbing contract in connection with alterations, costing $20,000, to departmental store for the Montreal Light, Heat & Power Co.

Montreal, Que.—J. Colford, 508 Grey Street, has plumbing and heating contract in connection with alterations, costing $9,500, to the factory of Stuart Bros.

Hamilton, Ont.—Bloom & Britton, 121 James Street, have the plumbing and heating contracts in connection with the conversion of hotel into apartments, at a cost of $10,000, for Ed. Carleton.

Montreal, Que.—Gustave Fontaine, 210 Plessis Street, has the plumbing and heating for two stores, costing $8,000, for J. H. Lamarche, 266 Outremont Avenue, Outremont.

HE GOT THERE

The sanitary engineer is as a rule a man of resource and initiative. The very nature of his calling necessitates this. The possession of these qualities was well exemplified recently in the case of our fellow-craftsman, B. J. Miller, of Bathurst Street, Toronto, who joined Canada's fighting forces at the beginning of the war, and, after being wounded at the front, was sent home on sick leave, having been in the interim promoted to the rank of lieutenant.

At the time of the Halifax disaster Lieut. Miller was on duty at Stanley Barracks and was placed in command of a company of sappers and engineers, who were being sent to Halifax as a military relief party on December 8th. Arriving at Moncton about 8 p.m. on Sunday, the 9th, it was found that owing to the storm it was impossible to proceed further. The chief of the party, however, patrolling around, discovered a large locomotive attached to a freight train, to which a private car was connected, and upon inquiry he found that it was a special relief train for Halifax despatched by Baron Shaughnessy in charge of Mr. Chamberlin, the High Chief Constable of the C. P. R.

Here we regret to have to record a lamentable falling away on the part of Lieut. Miller from the observance of those admirable precepts which were no doubt inculcated in him from his youth up, and for which the late George Washington, of cherry tree and hatchet fame, is so justly renowned.

On his request for his car and men to be hitched up to the freight train being refused, Lieut. Miller (we blush to write it) boldly declared that he had official instructions to meet the Baron's relief train and have his men and car coupled up and taken to Halifax.

This "terminological inexactitude" resulted in Lieut. Miller's car with its living freight being discovered when some miles out from Moncton by Mr. Chamberlin, much to the latter's surprise, attached to his own train, and he at once sent for the guilty (?) party and demanded an explanation.

All's well that ends well, however, and upon being acquainted with the circumstances of the case Mr. Chamberlin expressed his gratification at the result of our friend J. B. Miller's deviation from the straight path of veracity and at his own ability to be of service to the party, in whose work he subsequently took no small interest.

WATERWORKS, SEWAGE, ETC.

Kincardine, Ont.—Council contemplate purchase of sewage tank.

Brantford, Ont.—Tenders will be called for sewer pipe and cement.

Chatham, Ont.—Tenders will be called for supplies for the Board of Works.

North Vancouver, B.C.—City Council contemplate the erection of a $50,000 filtration plant.

Brockville, Ont.—Council intends to spend $15,000 on the extension of the waterworks sewerage system of the town.

Harwich Township, Ont.—Council has authorized drainage work costing $18,000.

Daysland, Alta.—Provincial Government contemplate construction of two drainage systems.

Brooke Township, Ont.—Council has completed specifications for repairs to the Weedman drain.

London, Ont.—City Council will construct an eight-inch sanitary sewer costing $3,500 on Cheapside Street.

Montreal, P.Q.—Fire Chief Tremblay recommends that a high-pressure water mine be laid along Dorchester Street and on St. Catherine east to Amherst.

Point Grey, B.C.—Council decided to repair a storm sewer and extend it along Granville Street, from Fifty-seventh Ave., at an expenditure of $2,525.

Ojibway, Ont.—Canadian Steel Corporation will construct this Spring a complete waterworks plant for Ojibway, to have a capacity of 7,000,000 gallons per diem.

Essex County, Ont.—Ratepayers of Essex County will vote on the trunk sewer proposition recommended by the Essex Border Utilities' Committee on March 28th.

WORKS AUTHORIZED

London, Ont.—City Council will construct an 8-inch sanitary sewer, costing $3,500, on Cheapside Street.

Toronto, Ont.—The Board of Works has passed an estimate of $34,200 for the construction of sludge beds and $13,000 for the reconstruction of sewer on Yonge Street.

CONTRACTS AWARDED

Stettler, Alta.—J. A. Lockerbie Ltd., 10164-108th Street, Edmonton, have the general contract for the installation of heating system in the court house for the Department of Public Works, Provincial Government.

Sydney, N.S.—Hagen & Co., 452 George Street, have the heating and plumbing contracts for $40,000 church for the Union Baptist Congregation.

Winnipeg, Man.—Cotter Bros., Ltd., Fort Street, have the general contract for alterations costing $70,000, to heating and plumbing system in the old C. P. R. Hotel building for the Canadian Pacific Railway, head office, Montreal.

Watford, Ont.—Anguish & Whitefield, 40 Colborne Street, Bramford, have plumbing, heating, sewage disposal, and special water supply contract for $20,000 bank for the Merchants Bank of Canada.

St. Catharines, Ont.—J. Pearl, 49 King Street, has plumbing and heating contract in connection with $10,000 addition to Ridley College.

CONSTRUCTION

Halcourt, Alta.—The East Red River School District contemplate the erection of a school.

Vancouver, B.C.—The Navy League of Canada contemplate the erection of a home costing $30,000.

Halifax, N.S.—The Navy League of Canada contemplate the erection of a home costing $100,000.

Regina, Sask.—Contemplates building college at a cost of $200,000. Expect work will go ahead this year.

Fredericton, N.B.—The Hartt Boot & Shoe Co., Ltd., York Street, contemplate the erection of a $50,000 factory.

Winnipeg, Man.—Tenders to be called shortly for the construction of a deaf and dumb institute at a cost of $500,000.

Omemee, Ont.—Chas. Parsons & Son, Ltd., 79 Front Street E., Toronto, contemplate alterations costing $100,000 to their plant.

Trout Creek, B.C.—The Military Hospitals Commission, 22 Vittoria Street, Ottawa, contemplate the erection of a sanitorium.

Point Grey, B.C.—Department of Public Works, Provincial Government, contemplate the erection of university building at a cost of $175,000.

British Columbia, Province of.—Military Hospitals' Commission, 22 Vittoria Street, Ottawa, contemplate the erection of a $200,000 tubercular sanitarium.

Woodstock, Ont.—Provincial Legislature has passed an appropriation of $40,000 for two additional buildings at the Hospital for Epileptics, Woodstock.

Quebec, P.Q.—L. Auger, St. John Street, is preparing sketch plans for $100,000 four-storey stone building for the St. John Baptist Society.

WINNIPEG PLUMBING DIVISION

Permits issued

46

Inspections

Water Tests	Smoke Tests	Subsequent Inspections	Miscellaneous Inspections	Defects Rectified
21	71	290	22	170

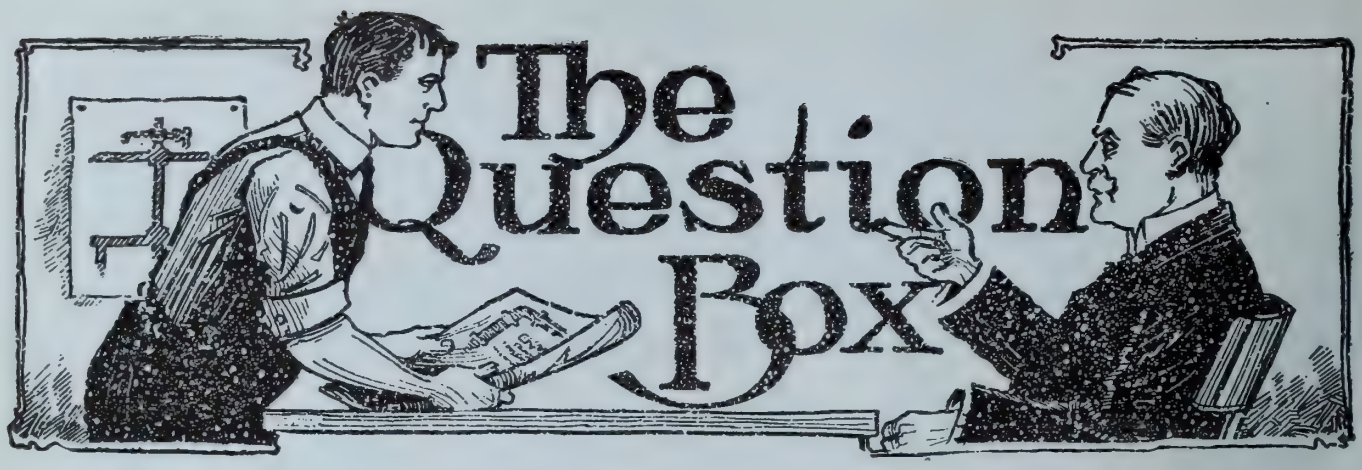
Sewer Division

Permits issued	Inspections
2	51

Flushing

Tank Flushings Gallons	Hose Flushings Gallons	Total Gallons of Water
1,488,640	783,750	3,272,390

The above table shows the work accomplished by the Winnipeg Plumbing and Sewer Inspection Department during the month of January—a public service that cannot but be of inestimable value to the citizens of Winnipeg.



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

WHAT'S THE DIFFERENCE

Editor Sanitary Engineer:—I am not very long in the heating business, but as men were so scarce my boss asked me to undertake a few repair jobs to a number of heating systems.

I would like to ask you first, where I can get one or two good books on heating, second, what is the difference between a one pipe steam job, and a two pipe job. Also what is meant by dry and wet returns.—Improver.

The accompanying illustration shows in simple form what would constitute a one pipe, as well as a two pipe job.

The piping shown at the left is a two pipe system, meaning that one pipe is used to convey the steam to the radiator, and another smaller pipe is used to carry the return water of condensation back to the boiler.

It might be well to explain that a two pipe steam system need not necessarily have wet returns, such as shown on left hand of illustration meaning that the return pipes are connected to a pipe situated below the water line in the boiler.

But the returns even through a two pipe job may be connected above the water line, thus constituting a two pipe steam system, dry returns.

The same with a one pipe job, as described on the right side of the boiler shown in illustration—it will be noted that the return in this case is dry, or, above the water line until it reaches the boiler. But, if the horizontal return had dropped down to the floor at the far end of the steam main, and a horizontal pipe had been run on the floor in a similar manner as the return shown on the left side of the boiler this would have been termed a wet return, and the air vent shown at A would have had to be at the end of the steam pipe opposite to where it is shown.—Editor.

TORONTO SANITARY ENGINEERS' TRIP

(Continued from page 21.)

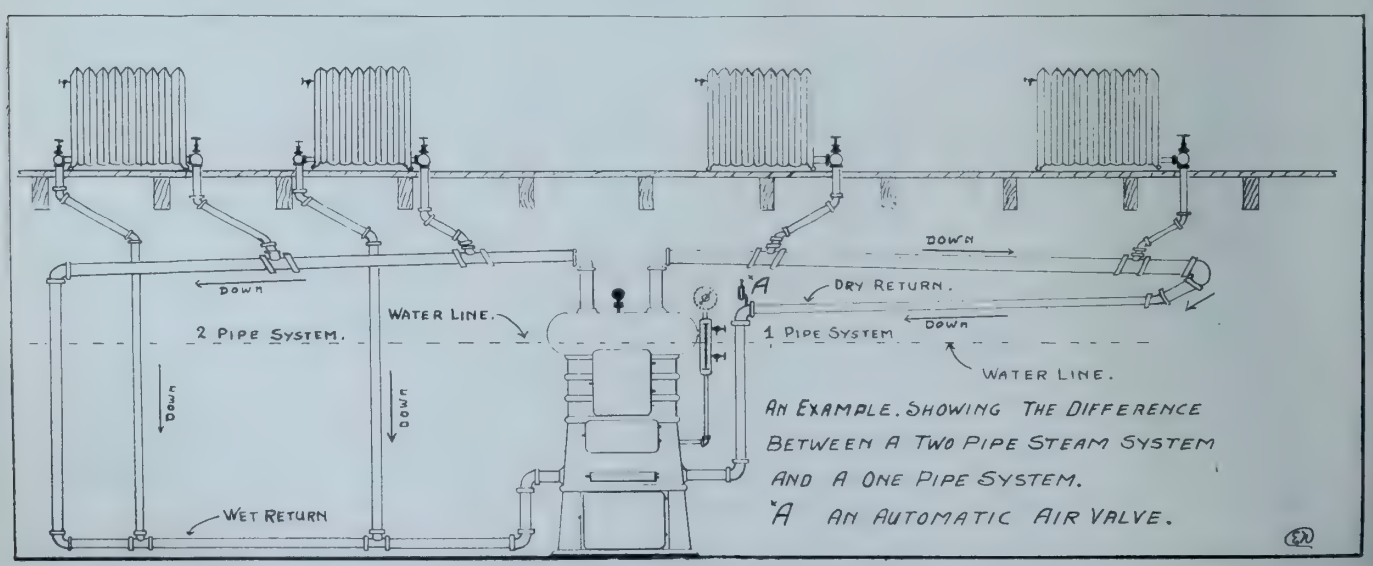
county jail, whereupon being admitted by jailor Charles Lieb, our party was conducted through the building by him and Sheriff Bradley.

The sanitary arrangements throughout the building were of an excellent order, and the general conditions prevailing for the health of the inmates were of the best. Everything was in apple-pie shape, and cleanliness was an outstanding feature in all departments. While this visit was the first for the members of our party to a building of this kind, official or otherwise, everyone was struck with the general state of efficiency and care that was used in looking after the welfare of the regular boarders by the staff of the jail.

The visiting party included the following:—

Harry A. Farthing, Norman Swanston, Fred Hogarth, Roy Belyea, Ross Belyea, Fred A. Wiles, John Cracknell, T. Frank Kelly, John Gowan, Will Cameron, Charles Chapman, A. F. Passmore, Gordon Ritchie, Robert J. Shannon, Harry G. Hicks, George Clapperton, George H. Cooper, Edwin Newsome, Kenneth J. Allison, Kenneth B. Allison, Garrett F. Frankland, John Cracknell and Lady Friend, Frank Kelly and Family, Cup.

Those returning on Saturday night experienced a slow trip owing to the snow and cold, arriving home several hours late.



Describing question submitted by improver.



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Globe and Angle Valves

BUILT from actual, practical experience. Made of the famous *MUELLER* steam metal and fully guaranteed against all defects in design and construction. Not a Valve, but *the* Valve.

¶ *MUELLER* globe and angle Valves can be repacked under pressure. The disc is so designed as to adjust itself to any position and still receive the thrust of the spindle on the center line; thus preventing any distortion to the seat or diaphragm. The pipe threads are full length, and are tapered to conform to I. P. Threads, insuring perfect joints.

¶ Full sized and unobstructed passages guarantee full service. The large Hexagons allow an excellent wrench grip and our design puts the strain where it belongs, so that there is no danger of distorting either the body or the bonnet. Furnished with enameled, Malleable iron wheel handles. Every *MUELLER* Valve tested to beyond unusual service conditions. Write for prices.

MUELLER **gate and check valves, steam cocks, etc. rank highest in every branch of exacting service.**

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"Exactly what I am after"—that's what thousands of sanitary engineers in Canada and the United States have said. Desolvo is the greatest time-saver ever put on the market for clearing choked waste pipes and thawing out frozen drains.

Drop a line on your letterhead, naming your jobber, and we will send you a trial can absolutely FREE.

Chamberlain Desolvo Co., Limited, Toronto

Stevenson Building, Church St., Toronto **GENERAL OFFICES, PITTSBURGH, PA.**

PURO

(MADE IN CANADA)

Every minute counts in getting maximum efficiency.

Our Puro Sanitary Drinking Fountains positively save 60% in drinking time, besides 35% of water ordinarily wasted. Can you afford to run your plant and lose and waste this money in old-fashioned drinking methods?

EFFICIENCY IS PATRIOTISM



Ask your efficiency expert to figure this out and you will find that:

500 men drink, say, twice a day. Under old conditions it takes between 3 and 5 minutes per man, twice a day. With PURO cutting the time in half, it would save from 1,500 to 2,500 minutes per day at an average wage of 20c per hour. The saving would be from $5.00 to $8.50 per day.

How long would it take to pay for installing our fountains?

NOW IS THE SEASON TO THINK OF YOUR WATER PROBLEMS.

ASK OUR EXPERT ADVICE.

Puro Sanitary Drinking Fountain Co.

147 University Ave., TORONTO, CAN.

OJIBWAY TO HAVE SEPARATE WATERWORKS

Ojibway, Ont., has decided to instal a separate waterworks owing to the fact that the plans of the Canadian Steel Corporation have progressed to such a point that they have to be carried out without waiting for a joint water supply from the border cities.

The Ojibway waterworks will have a capacity of five million gallons per day. The size may be judged by the fact that the average water pumped in Windsor last year was seven million per day.

Plans for the Ojibway waterworks have been approved by Dr. McCullough, chief officer of health for the province, and also by the Dominion authorities, as the intake will be out in mid-channel, which is under federal control. It is expected tenders will be asked at once and contracts awarded.

O. E. Fleming, K.C., counsel for the Canadian Steel Corporation, said W. B. Perley, vice-president and general manager, was anxious that it should be made clear the new waterworks will not interfere with the plans of the Essex Order Utilities Commission for an improved supply to serve the metropolitan district. This new water plant is to be installed for temporary needs.



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NO NOISE.

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CONSTRUCTION

Three Rivers, Que.—Canadian Pacific Railway, head office, Montreal, propose to erect a $30,000 station at Chamflour and St. Maurice Street.

Montreal, Que.—Gillette Safety Razor Company will enlarge its plant to five times the present capacity. The addition will cost about $750,000, and $180,000 worth of new machinery will be installed.

London, Ont.—Provincial Legislature has passed an appropriation of $20,000 for a new wing and treatment room for the Hospital for the Insane here.

Brantford, Ont.—Steel Company of Canada will build an addition to its plant here, involving an expenditure of $100,000.

Campbellton, Ont.—Northumberland Paper and Electric Co. intends to repair and enlarge in the spring its building, which was damaged by fire recently.

Hamilton, Ont.—Provincial Legislature has voted an appropriation of $40,000 for the erection of a new wing and $10,000 for a new boiler house for the Hospital for the Insane in this city.

Sandy had been courting Janet for the last two years. One evening, after a silence lasting nearly an hour, Janet murmured:

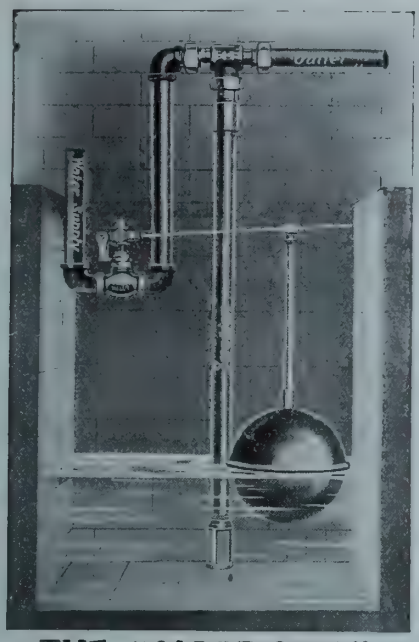
"A penny for yer thochts, Sandy."

"Weel," replied Sandy, with sudden boldness, "I was just thinking hoo fine it wud be if ye were to give me a bit kissie."

Janet complied, and again there was silence.

"An' what are ye thinking about noo, Sandy?" Janet ventured after a bit. "Anither?"

"Na, na, lassie; it's mair serious the noo! I was just thinkin' that it was about time ye were payin' me that penny for me thochts!"



THE "MORRISON"

A Cellar Drainer

Without an Equal

Automatic in operation, and dependable. Requires no attention when once adjusted, the water turned on and put into operation, being actuated by the raising or lowering of float as the water level changes. It operates purely by water. It works under a far greater range and gives much larger capacities than any other device on the market, so far as we know, operating as low as 10 lbs. water pressure.

The operating limits of most types of cellar drainers range from 15 to 18 feet lift. The Morrison cellar drainer will lift as high as 30 feet at 60 lbs. pressure.

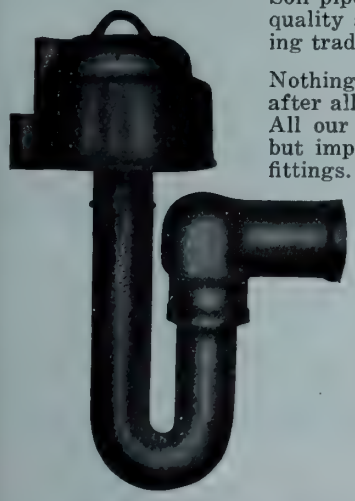
All working parts above water. Nothing to get out of order.

The James Morrison Brass Mfg. Co., Ltd.

93-97 Adelaide St. W., Toronto

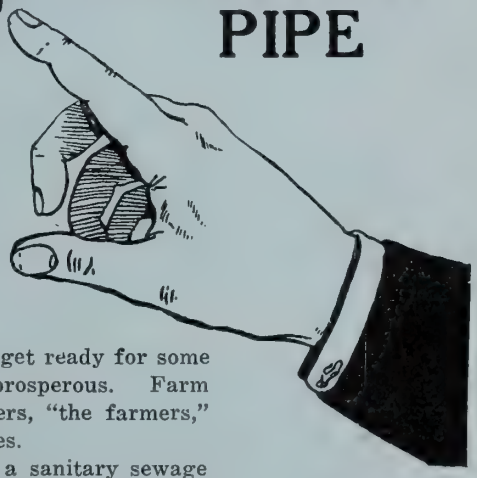
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THE PERMANENT PIPE



Soil pipe and fittings that can be depended upon for quality are very necessary in the sanitary engineering trade.

Nothing is so annoying as to find a stack leaking after all the roughing-in is done and the test put on. All our products are made to formula and nothing but improper usage can destroy "Anthes" pipe and fittings.



GET READY

The time will soon be here when you should get ready for some country business. Farmers were never so prosperous. Farm journals are all advocating that their readers, "the farmers," should have plumbing installed in their homes.

A plumbing system is not complete without a sanitary sewage disposal system and the heart of every sewage system is the "Anthes" syphon. We know this and can make prompt shipments.

We manufacture a full line of cast iron pipe fittings at both our plants. Ask your jobber for "Anthes" Pipe and Fittings and "Anthes" Syphons and accept no other.

ANTHES FOUNDRY, LIMITED

TORONTO and WINNIPEG

Lloyd George
and the War

IS Lloyd George slipping back? Downing Street men and War Cabinet men are in the scales of public judgment. Col. John Bayne Maclean contributes to the March issue of MACLEAN'S MAGAZINE a strong article dealing with the need for efficiency in the Lloyd George Government and giving interesting information with reference to the young man who is rapidly coming to the front in Imperial affairs—Sir Eric Geddes, the head of the Admiralty. This contribution is one of a notable series by

John Bayne Maclean

"SIXTEEN MONTHS IN GERMANY."
What a Canadian Prisoner saw and heard there—and how he escaped," By John Evans

This article presents a picture of conditions in Germany and gives many new facts with reference to what is going on in that country. The writer worked for sixteen months in the mines of Westphalia and came in close contact at all times with the miners. The story of his escape is a thrilling one.

"CANADIANS IN MESOPOTAMIA."
By a Canadian Medical Officer.

Little has been known heretofore of the campaign in Mesopotamia. This article gives details of the campaign and of the part which Canadians are taking in it. It shows how the inefficiency of the first campaign has been done away with and how splendidly organized the British army now is. The article contains many interesting anecdotes of adventure on that front.

"LABOR THE DOMINANT FACTOR."
By Agnes C. Laut.

This is an article on the war situation as it is developing on this side of the Atlantic, showing that labor is becoming a dominant factor. In the United States the antagonistic attitude of the labor union is dying out and being replaced by a strong desire to assist in war measures.

"CANADA'S NEW BOSS."
By H. F. Gadsby.

A political article, dealing with the "man behind" Union Government. It gives interesting and exclusive information with reference to the political situation at Ottawa as it is developing since the election.

"A CASUALTY."
By Robert W. Service.

A war poem which tells of an experience which actually happened to Service while driving a motor ambulance on the Western Front. It will be illustrated by C. W. Jefferys.

Fiction in the March Number

"BY THE TIP OF AN EYELASH," by A. C. Allenson, illustrated by R. M. Brinkerhoff. A bright story combining business, love and horse racing.

"THE GARDEN OF SPICES," by L. M. Montgomery, illustrated by F. Weston Taylor. This is a most unusual and charming love story.

Two long instalments of the two serials **"THE PAWNS COUNT,"** by E. Phillips Oppenheim, and **"THE MAGIC MAKERS,"** by Alan Sullivan.

"THE GIRL ON THE VERANDAH," by Arthur Beverly Baxter, who wrote **"The Man Who Scoffed," and "Mam'selle Butterfly."**

Regular Departments and Features

There are the regular features and departments: Review of Reviews; Business Outlook; The Investment Situation; The Nation's Business; Books; Women and Their Work. A food article by Miss Chapman is a feature, and a new Spring Department on Seeds and Garden Culture starts in this number.

MacLean's Magazine
At all News Stands—20c.

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For Efficient and Economical heating, specify Daisy Hot Water Boilers and Viking Radiators and conserve the fuel for your country by this installation.

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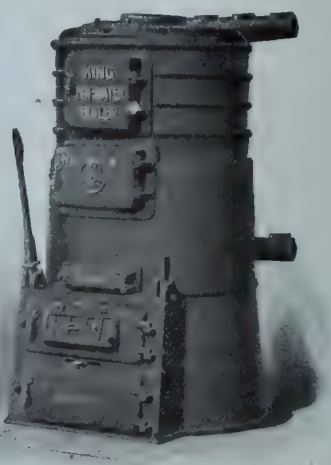
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King Boilers get up heat quickly

Very shortly after the fire is lighted in a King Boiler hot water reaches the radiators. The thin, peculiarly shaped waterways in the "King" mean quickly heated water and perfect circulation. The perfect circulation causes a saving in fuel because it obviates the necessity of "extra firing" to move cold water from the radiators.

The Trade should use this quick-heating, fuel-saving argument now while fuel is scarce and high in price.



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3 Sizes Capacities ⅛ to 8 inch pipe



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Better go prepared and clinch a lifelong customer on your first visit.
They won the "Grand Prize" of the P.P.I.E.

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World-Famed Specimens of the Age of Steel

TRIMO



WITH FLAT-LINK OR CABLE CHAIN



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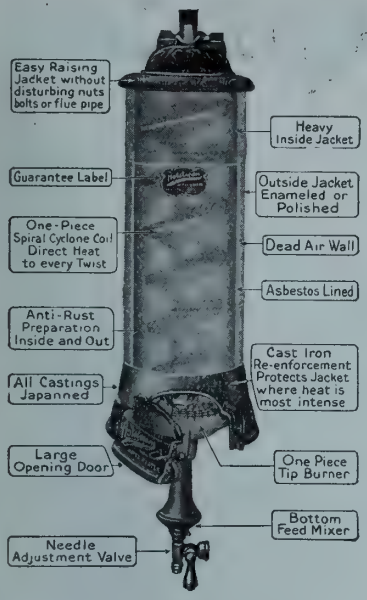
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United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Air Valves.
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Beaton & Corbin Mfg. Co., Southington, Conn.
Canadian Wolverine Co., Ltd., Chatham.
C. A. Dunham Co., Ltd., Toronto.
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James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.

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Galt Brass Co., Limited, Galt.
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Chain Wrenches.
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Damper Regulators.
C. A. Dunham Co., Ltd., Toronto.

Drainage Fittings.
Canada Metal Co., Ltd., Toronto.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.

Drinking Fountains.
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London, Ont.
Puro Sanitary Drinking Fountain Co., Toronto.

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Trimont Mfg. Co., Roxbury, Mass.

Packing.
Canadian Wolverine Co., Ltd., Chatham.

Packless Radiator Valves.
Kerr Engine Works, Walkerville.

Pipe and Radiator Hangers.
Beaton & Cadwell Mfg. Co., New Britain, Conn..
Beaton & Corbin Mfg. Co., Southington, Conn.

Pipe, Black and Galvanized.
Canadian Tube & Iron Co., Ltd., Montreal.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.

Pipe Cleanser
Chamberlain Desolvo Co., Ltd., Toronto.
Canadian Wolverine Co., Ltd., Chatham.

Pipe Cutters.
Trimont Mfg. Co., Roxbury, Mass.

Pipe Joint Compounds.
Canadian Wolverine Co., Ltd., Chatham.
James Morrison Brass Mfg. Co., Ltd., Toronto.

Pipe, Soil, and Fittings.
Anthes Foundry Co., Toronto and Winnipeg.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Toronto Hardware Mfg. Co. Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.
Warden King, Ltd., Montreal.

Pipe Threading Tools and Machinery.
Borden Canadian Co., Toronto.
John Hall & Sons, Ltd., Brantford.
A. B. Jardine & Co., Hespeler.

Pipe Wrenches.
Borden Canadian Co., Toronto.
Trimont Mfg. Co., Roxbury, Mass.

Porcelain Ware.
Canada Metal Co., Ltd., Toronto.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
L. Wolff Manufacturing Co., Chicago.

Pumps.
C. A. Dunham Co., Ltd., Toronto.
Galt Brass Co., Ltd., Galt.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Ontario Wind Engine & Pump Co., Ltd., Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Radiators.
Lord & Burnham Co., Ltd., Toronto.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.

Radiator Foot Rests.
Beaton & Cadwell Mfg. Co., New Britain, Conn..

Radiator Traps (Steam).
C. A. Dunham Co., Ltd., Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Range Boilers
Toronto Hardware Mfg. Co., Toronto.

Reducing Pressure Valves.
C. A. Dunham Co., Ltd., Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co. Ltd., Sarnia, Ont.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Roof Flanges and Flashings.
Canada Metal Co., Toronto.
Simplex Manufacturing Co., Chicago.

Rubber Goods
Canadian Consolidated Rubber Co., Ltd., Montreal.

Septic Tank Valves and Syphons.
Anthes Foundry Co., Ltd., Toronto.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

Solder.
Canada Metal Co., Ltd., Toronto.
Hoyt Metal Co., Toronto.

Steam Specialties.
Dart Union Co., Ltd., Toronto.
C. A. Dunham Co., Ltd., Toronto.
Kerr Engine Co., Walkerville, Ont.
James Morrison Brass Mfg. Co., Ltd., Toronto.
Peacock Brothers, Montreal.
United Brass Founders and Engineers, Ltd., Cornbrook, Manchester, England.

Steam Traps.
Geo. W. Cole Co., Ltd., Toronto.
Canadian Morehead Co., Ltd., Woodstock.
C. A. Dunham Co., Ltd., Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Smoke Test Machines.
James Morrison Brass Mfg. Co., Ltd., Toronto.

Tanks, Steel and Wood.
Ontario Wind Engine & Pump Co., Ltd., Toronto.

Testing Plugs.
James Morrison Brass Mfg. Co., Ltd., Toronto.

Tools.
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Trimont Mfg. Co., Roxbury, Mass.
Williams, J. H., & Co., Brooklyn, N.Y.

Unions.
Canada Metal Co., Ltd., Toronto.
Dart Union Co., Ltd., Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Vapor Heating Systems.
C. A. Dunham Co., Ltd., Toronto.
Moline Heat, Moline, Ill.

Vent Caps
Anthes Foundry, Ltd., Toronto.
Toronto Hardware Mfg. Co., Toronto.

Vitro Tanks.
Cluff Mfg. Co., Ltd., Toronto.

Vacuum Systems of Heating.
C. A. Dunham Co., Ltd., Toronto.

Water Supply Systems.
Empire Mfg. Co., Ltd., London, Ont.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Ontario Wind Engine & Pump Co., Ltd., Toronto
Warden King, Ltd., Montreal.

Monuments To Wolff Plumbing



Michigan Avenue, Chicago, from Seventh Street north to Washington Street.

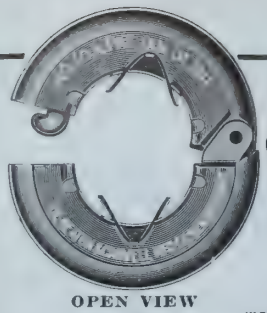
The following buildings on this world-famous Avenue are equipped throughout with Wolff Plumbing:

1. Blackstone Hotel
2. Congress Hotel
3. Congress Hotel Annex
4. Auditorium
5. Studebaker
6. Chicago Club
7. McCormick Building
8. Stratford Hotel
9. Railway Exchange
10. Orchestra Hall
11. Pullman Building
12. Theo. Asher Company
13. Edson Keith & Company
14. Gage Brothers & Company
15. Chicago Athletic Club
16. Tower Building
17. Ward Building
18. Chicago Public Library

L. WOLFF MANUFACTURING COMPANY

Manufacturers of Plumbing Goods Exclusively

General Offices: 601 W. Lake St. CHICAGO *Showrooms:* 111 N. Dearborn St.



OPEN VIEW NO. 10-A.

The CEILING PLATE that's better



TOP VIEW NO. 10-A.

THE NO. 10—A NARROW FLANGE PLATE IS A STEEL HINGED PLATE. FLANGES ¾" WIDE. HIGHLY FINISHED. ESPECIALLY DESIGNED FOR TWIN CONNECTION "NARROW."

The split ceiling plate is coming more and more into use than ever and ALWAYS GIVES A NICE FINISH, because it can be attached to mains and risers at the very last, and is not exposed during completion of a building on the floors.

High quality at the right price.



Gem No. 4.

Gem No. 4 Automatic Air Valve

Made from the best brass obtainable. Pressed shell and pressed brass base which eliminate danger from blowholes, which is a fault with cast bases.

Write for catalog showing our complete line of specialties.

The BEATON & CADWELL MANUFACTURING Co.

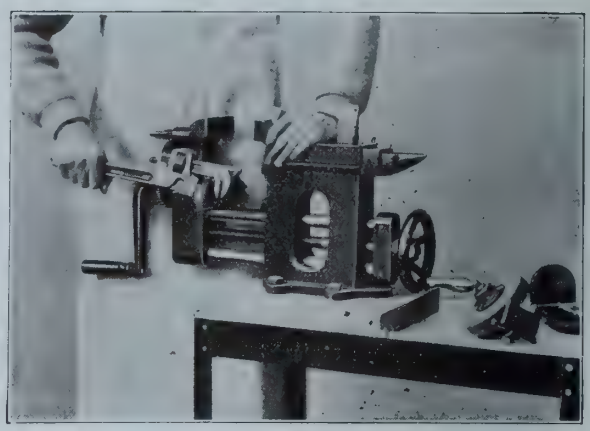
New Britain, Conn.

Eastern Agent: J. R. Devereux & Co., 233 St. James Street, Montreal. Western Agent: A. E. Hinds & Co., Chamber of Commerce, Winnipeg.

THE

Stewart Handy Worker

An Equipment All in One



WEIGHS 90 POUNDS

The Equipment Comprises——

A Pipe Vise
A Bench Vise
A Bench Grinder
A Two-Speed Drill
A Hardy Cutter
An Anvil

It's not a toy. It's a real combination of practical tools for practical people.

Write for full particulars.

CHICAGO FLEXIBLE SHAFT COMPANY

12th Street and Central Avenue

Department H.W. CHICAGO, U. S. A.

WROUGHT PIPE

BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES

Black and Galvanized All Sizes

Ask your jobber for CT Brand

CANADIAN TUBE & IRON CO., LIMITED

Montreal Works: Lachine, Can.

HOYT METAL GOODS ARE KNOWN

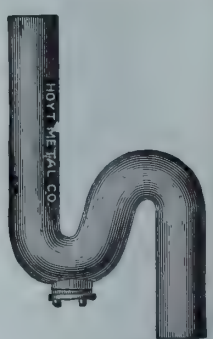
FROM COAST TO COAST



As time-savers there are none equal to our Wiping Solder, Bar or Wire Solder.

Hoyt Lead Traps, bends and waste pipe are in a class by themselves.

All our products are made to formula.



Our Mixed Metal Sales Amount To Over $5,000,000 Annually.

Write your Jobber

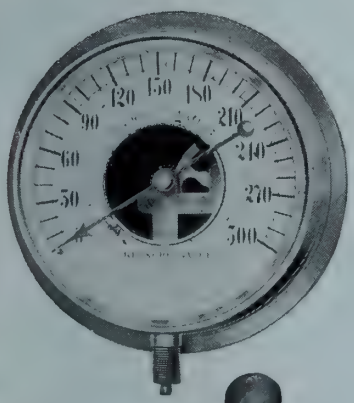
HOYT METAL COMPANY, TORONTO, ONTARIO

New York, N. Y., London, Eng., St. Louis, Mo.

Write Us









FIVE WORKS—OVER 3,000 EMPLOYEES

UNITED BRASS FOUNDERS and ENGINEERS, Limited

It is our intention after the War to devote our energies to the intensive production of the following Specialities:

Gunmetal and Brass Valves and Cocks.
Steam, Water and Compressed Air Fittings generally.
Cast Iron Stop and Sluice Valves.
Semi-Rotary Pumps.
Extruded Brass and Bronze Bars.
Brass Bolts and Nuts, Studs and General Turned Work from the Bar
Cast and Malleable Iron Cocks and Pipe Fittings.
Pressure and Vacuum Gauges.
Injectors, Engine Governors.
Spraying Machinery.
Coppersmiths' Work.
"Stella" Brand Alloys, Manganese Copper, Silicon Copper, Ferro Zinc, Phosphor Copper and Tin, etc.

Business After the War

If you are interested in any or all of the lines mentioned and are in a position to take a hand in the energetic distribution of the same, please communicate with us NOW to our Head Office.

EMPRESS FOUNDRY

Cornbrook, Manchester, England



PIPE THREADING AND CUTTING TOOLS

One Man Can Thread up to 12 Inch.



Cuts Without Burring

No. 1 cuts from ⅛″ to 1″
No. 5 cuts from ½″ to 2″
No. 10 cuts from 2½″ to 4″
No. 15 cuts from 4″ to 6″

You cannot afford to expect your men to make horses of themselves. If they did they could not keep it up. Our tools save time, do better work and makes life worth living for your men.

Ratchet	Geared
No. 6—¼″ to ¾″.	No. 41—2½″ to 4″.
No. 25—1″ to 2″.	No. 61—2½″ to 6″.
No. 26—1″ to 2″.	No. 80—4½″ to 8″.
	No. 90—9″ to 12″.

The Borden-Canadian Company
TORONTO, CANADA

WE SPECIALIZE

In the Manufacture of

CAST IRON SOIL PIPE and FITTINGS

as well as

GALVANIZED RANGE BOILERS AND EXPANSION TANKS
FOR HEATING SYSTEMS

TORONTO HARDWARE MFG. CO., LIMITED

"HAUSE" PIPE JOINT CEMENT

For steam, water, air, oil, gas, gaskets, etc. The cement that cements. Sets like gum. Allows no leaks.

The Great Value of "HAUSE PIPE JOINT CEMENT" lies in its peculiar chemical properties which permits of its hardening and expanding after the joints are made up. In making up joints it has the same effect as a lubricant on the best graphite, and while the joints may be made and broken readily, a perfectly tight joint is maintained at all times. Comes in 1-lb., 5-lb., 15-lb., 25-lb., 50-lb. cans, 100-lb. barrels. Manufactured in ready mixed and powder form. Ask your jobber for prices, or write us direct.



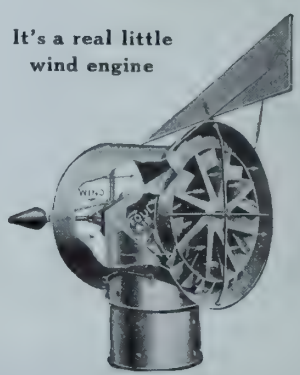
Manufactured in Ready Mixed and Powder Form.

Made in Omaha, Neb., U.S.A., by

Chas. F. Hause Mfg. Co., Inc., Omaha, Neb.

THE BICALKY

It's a real little wind engine



VENTILATOR

Is a positive suction fan that ventilates

The "Bicalky" will dispense with all auxiliary heaters on local ventilation systems.

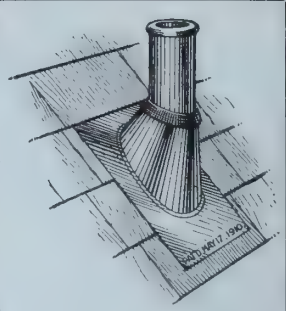
It is, as far as we know, the most scientifically constructed, self-propelled fan ventilator on the market.

Write us for full particulars.

BICALKY FAN CO.
BUFFALO, N.Y.
Canadian Sales Agents:
J. S. Chapman & Company
89 Jarvis St., Toronto

The SIMPLEX Adjustable Roof Flange

Fits any roof from ½ pitch to flat—just slide it down the pipe and it will conform with the pitch of the roof.



Trade Price 2″ $1.00 4″ $1.15

Made in all sizes—For sale by nearly every jobber

Simplex Mfg. Company - Chicago, Ill.
Canadian Representative; W. H. CUNNINGHAM, 98 Kingswood Road TORONTO, ONT.

Special Narrow Rim "B & C" No. 15



Combination Plate made expressly for the Canadian Trade

Sizes ½ to 2 inch.

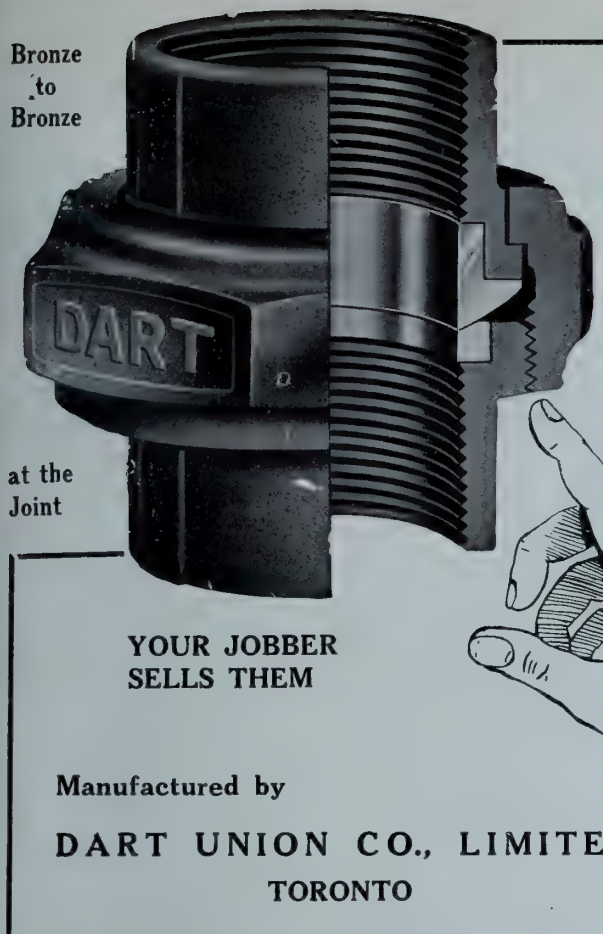
Similar to No. 10 Steel Plate

One of our many styles of narrow flange plates.

A stock of these goods carried for the convenience of our customers by our Canadian Representative

W. H. CUNNINGHAM, 98 KINGSWOOD RD., TORONTO, Can.

THE BEATON & CORBIN MFG. COMPANY
Southington, Conn., U.S.A.



YOUR JOBBER
SELLS THEM

Manufactured by

DART UNION CO., LIMITED
TORONTO

Here's insurance against pipe coupling troubles

When you commence to use Dart Unions you cease to worry over couplings. Experience soon teaches you that "Bronze to Bronze at the Joint" means a permanently tight, sure joint that won't loosen up and leak. Furthermore you find that the ball-shaped seat allows for an easy connection regardless of the alignment of the pipe.

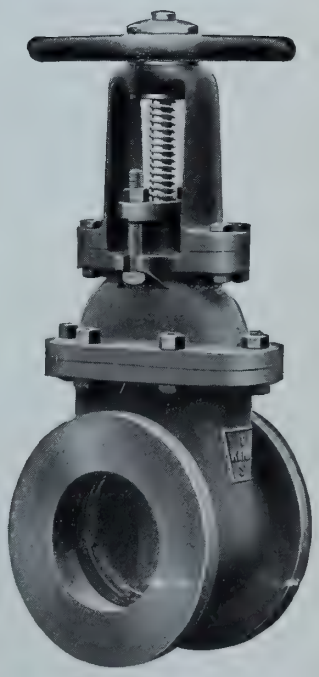
If you have never used Dart Unions, try them on your next job and see if they don't mean insurance against pipe coupling troubles.

There Are Lots of Gate Valves



advertised and sold, but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.

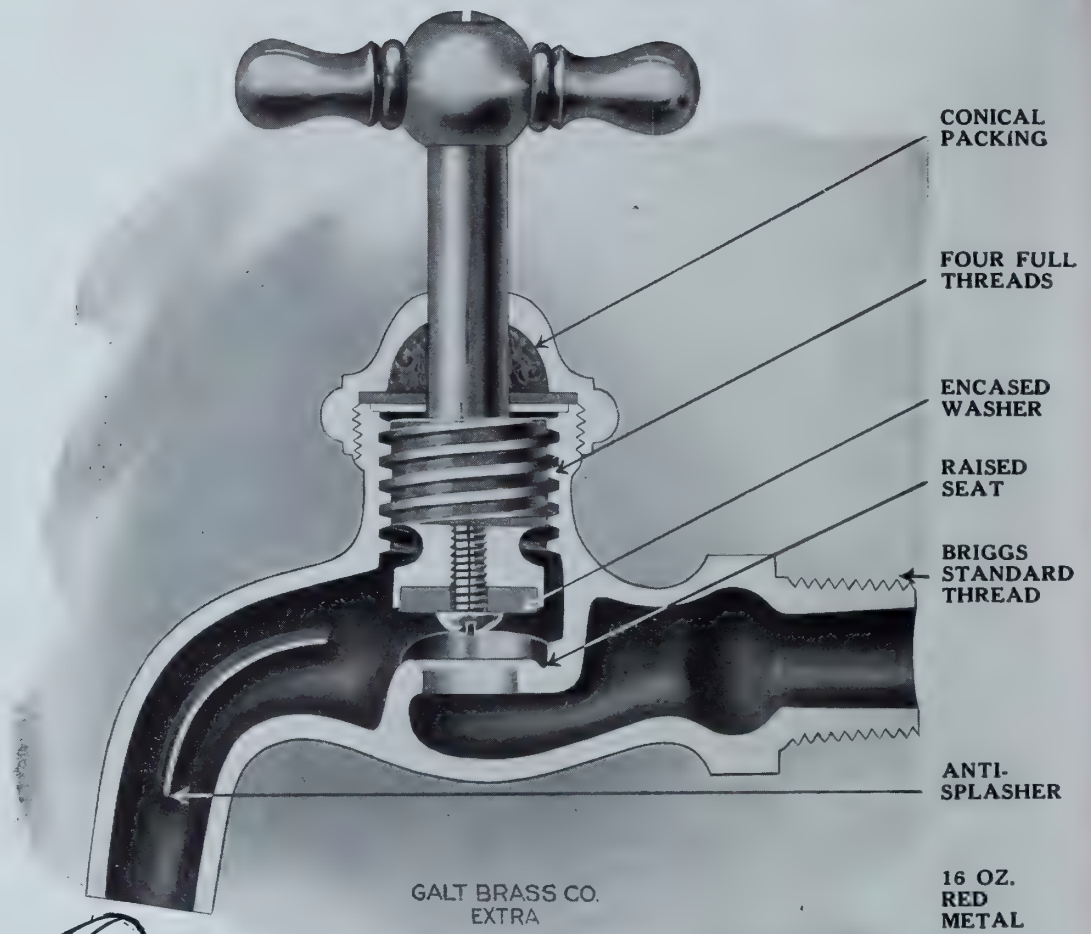
Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.

Approved by the Fire Underwriters Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario

Registered **PERFECTO** *Trade Mark*

You Can Install This Line and Establish Confidence of Your Customers





GUARANTEE

Any article of our make proving defective through inferior metal, or improper workmanship, on our part, will be replaced with TWO good ones, at NO CHARGE to you

CAN YOU BEAT IT?

SEND US YOUR ORDER NOW

Galt Brass Company, Limited

Galt, Canada

SANITARY ENGINEER

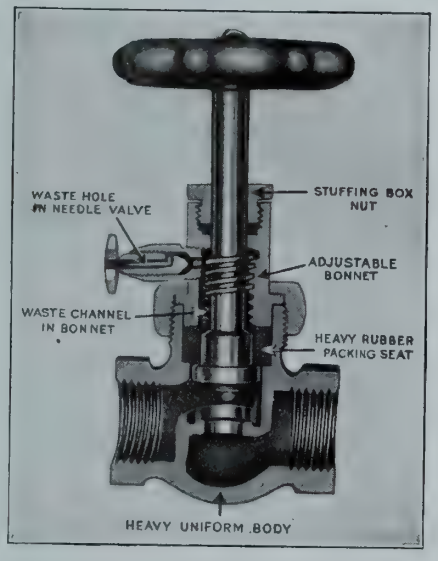
PLUMBER & STEAM FITTER of CANADA

Vol. XII. Publication Office, Toronto, March 15, 1918 No. 6

A Real Compression Stop and Waste Cock



Nothing is so annoying as a stop and waste cock that DOES NOT STOP AND WASTE every time it is closed. In introducing this new line of compression stop and waste, we know it will do all that is required of it.



The following are some of the chief features that go to make up this, our latest model. Just look at the accompanying sectional view. Full weight heavy designed, red brass and accurately fitted in every detail.

Needle valve on waste hole. This does away with the little brass tube or ordinary hole that has become more of a nuisance than anything.

Adjustable union fitted bonnet. This permits the waste valve being turned to any direction, no matter what position the stop cock is in.

Waste channel in bonnet is a good size and will not become easily blocked.

Heavy rubber packing seat which prevents any leaking when the stop and waste cock is open. This is a very important feature.

Ample sized stuffing box with knurled nut can be tightened easily with a pair of pliers.

When writing us or ordering from your jobber, ask for the Empire IMPROVED Compression stop and waste cock. It's a winner and we're proud of it.

EMPIRE MANUFACTURING CO., LIMITED

LONDON TORONTO

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While



A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for BEAVER BRAND CAST IRON ENAMEL WARE

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

ONTARIO:
Monarch Brass Mfg. Co., 71 Brown St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes, 120 Lombard St., Winnipeg

CANADIAN CONSOLIDATED RUBBER CO. LIMITED
DOMINION
RUBBER SYSTEM
AND ASSOCIATED COMPANIES

Extra Service

The service to be gained from any rubber product depends largely upon the quality of the material and the excellence of the workmanship. That is why Dominion Rubber System products are outstanding. Only the best in material and workmanship is incorporated in the making of those products. That ensures long service and life and proves a matter of no little economy to the buyer.

Over half a century of continuous manufacturing has taught the Dominion Rubber System how to produce qualities that will "stand up" under any circumstance, and, as a result, the products that carry the name and brand of the Dominion Rubber System are looked upon as the standard by which to judge qualities and values throughout Canada.

For anything in Rubber, write to our nearest Branch, where prompt and intelligent attention will be given to all enquiries.

Canadian Consolidated Rubber Co.
Limited

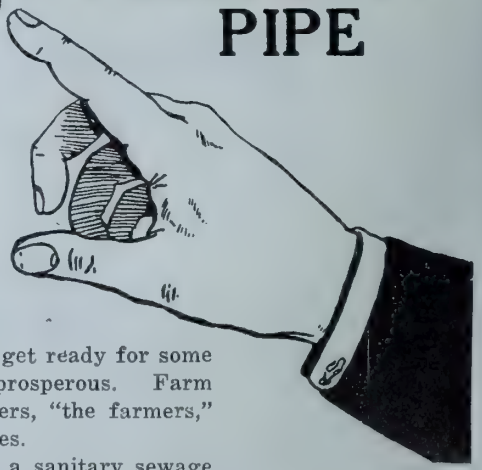
Head Office . . . MONTREAL

Service Branches at Halifax, St. John, Quebec, Ottawa, Toronto, Hamilton, Kitchener, London, North Bay, Fort William, Winnipeg, Brandon, Regina, Saskatoon, Calgary, Lethbridge, Edmonton, Vancouver, Victoria.

ANTHES FOUNDRY LIMITED.

THE PERMANENT PIPE





Soil pipe and fittings that can be depended upon for quality are very necessary in the sanitary engineering trade.

Nothing is so annoying as to find a stack leaking after all the roughing-in is done and the test put on. All our products are made to formula and nothing but improper usage can destroy "Anthes" pipe and fittings.

GET READY

The time will soon be here when you should get ready for some country business. Farmers were never so prosperous. Farm journals are all advocating that their readers, "the farmers," should have plumbing installed in their homes.
A plumbing system is not complete without a sanitary sewage disposal system and the heart of every sewage system is the "Anthes" syphon. We know this and can make prompt shipments.

We manufacture a full line of cast iron pipe fittings at both our plants. Ask your jobber for "Anthes" Pipe and Fittings and "Anthes" Syphons and accept no other.

ANTHES FOUNDRY, LIMITED

TORONTO and WINNIPEG

PIPE THREADING TOOLS

It is Evidence Like This



"Toledo" Geared Adjustable Threading Tool No. 2 making a cut and thread on a 4-inch bend in position. It was desired to install a steam separator above throttle of engine, and the whole job was satisfactorily completed without removing the pipe line.

which proves the extra value of "Jardine" and "Toledo" Pipe Threading Tools

"Jardine" and "Toledo" Pipe-Threading Tools cut clean, sharp threads with a minimum of muscular effort. They permit of one man doing work which ordinarily requires two. But even more important than this, they will work in any odd corner. Instance the job illustrated in the accompanying engraving. Here is a case where, with an ordinary tool, the whole pipe line would have had to be taken down. The tool paid for itself on that one job.

Investigate "Jardine" and "Toledo" Tools yourself. Ask us to send names of users in your locality. Then go and talk to these men in your own business and learn what they think of these good tools.

A. B. JARDINE & CO., Limited, Hespeler, Ont.

Sole makers of "Jardine" Pipe-Threading Tools.
Sole licensees to manufacture and sell Toledo Pipe-Threading Tools in Canada.
Agents, Winnipeg and West—Stanley Brock, Ltd., Winnipeg, Man.
Brockville and East—J. R. Devereux, 233 St. James St., Montreal.
Belleville and West—W. H. Cunningham, 98 Kingswood Road, Toronto, Ont.

A Plain Statement

You are complaining about the amount of business you have in the plumbing line, but what are you doing to improve it?

We tried to interest you a few weeks ago in our new catalog covering the complete line of "Pittsburgh" Water Heaters. The number of requests for this catalog certainly did not show any great interest on your part.

We next tried to interest you in our special sales campaigns—the Direct-by-Mail plan of advertising to your customers—with the same result.

Now, we are still willing and anxious to help you help yourself, if you will only give us the chance. You have a wonderful opportunity just now when the furnace fires go out and that hot water service is discontinued, to sell your customers an Automatic Gas Water Heater.

Write us at once for the plan, and we will prove to you that we can help you make the sale and make some money.

PITTSBURGH WATER HEATER COMPANY

Canadian Warehouse: 124 Richmond St. West, TORONTO

Distributors:

WINNIPEG — **MONTREAL** 99 Drummond St. — **TORONTO** 12 Queen St. East — **CALGARY**

FOUR REAL WINNERS

THE TUB AND THE MEN

THE ARISTOCRAT

When we first took up the problem of manufacturing laundry tubs we had the best tubs on the market before us. We knew that we must make a new type of tub, the old type of cement tub having brought down all manner of disrepute upon cement tubs.

And now we know we have the first real laundry tub with cement as one of the ingredients in its make-up, and we're proud of it.

We advertised for a suitable name and have great pleasure in awarding

A FIFTY-DOLLAR BOND

each to the following three successful competitors:

Roy Belyea, Toronto, Ont.
E. Hensley, Peterboro, Ont.
H. E. Shade, Victoria, B.C.

These three men between them did some pretty tall thinking and no doubt will long remember the winning of **their prize Victory Bond.**

We know that to buy and install an **"Aristocrat"** tub that is to choose a tub that is backed by every dollar we own. A tub that is practically made. A tub that will give maximum service. Read a few of the outstanding features:



"THE ARISTOCRAT"



LET US SEND YOU ONE

- Extra heavy, rust proof, zinc metal rim with solid soldered joints, thus eliminating any sharp, scratchy corners.
- Nickel plated strainers, with independent overflow, thus preventing tub filling above fixed height. This is a splendid improvement over old styles of tubs.
- Two nuts cast in back to fasten cover, or extension back on if required.
- Metal wringer guards moulded solid into ends as well as centre division.
- Round moulded corners, inside as well as outside.
- Outlets placed well away from centre division and tub will drain itself dry.
- Neatly designed substantial legs.

Improved strength and quality from use of trap rock and best Portland cement, and will not absorb moisture.

THE CANADA METAL CO., Limited

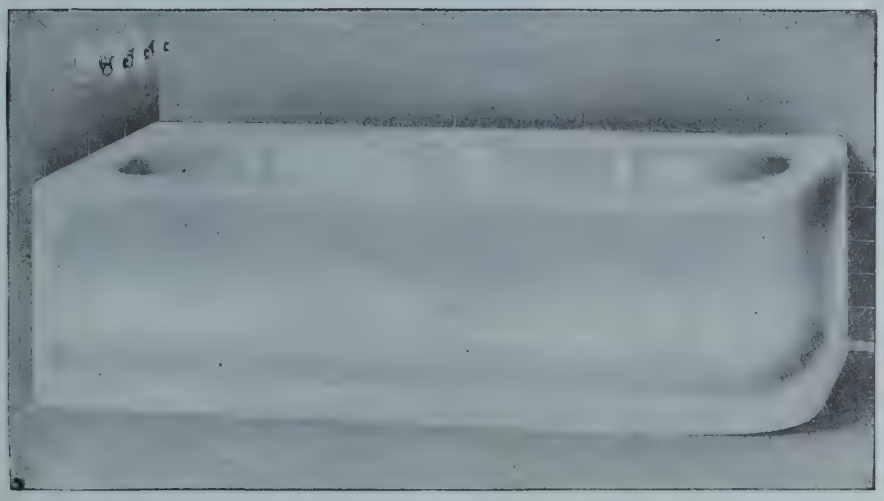
TORONTO, CANADA

Hamilton Montreal Winnipeg Vancouver

We Have Everything for the Plumber

"Standard"
"Perfection" Built-In Baths

Made in One Piece Enamelled All Over



These Baths represent the last word in design and finish, and are made to build into Right or Left Hand Corner or into a Recess.

The "Perfection" Built-in Bath is only 17½ inches high, therefore convenient. It builds into walls and floors, the absence of all dust-collecting cracks and corners, meaning bathroom sanitation.

Made in 5 and 5½ foot sizes.

Illustrations on request.

Write the nearest dealer.

Standard Sanitary Mfg. Co.
Limited

General Office and Factory, Royce and Lansdowne Aves., Toronto, Ontario

Toronto Store:
55-59 Richmond Street East

Winnipeg Showrooms:
76 Lombard Street

Hamilton Store:
20-28 Jackson Street West

Montreal:
4 Beaver Hall Square

Calgary:
31 Canada Life Building

Vancouver:
847 Beatty Street

"MADE IN CANADA"

Go Through any Wall

Stone or Brick without chipping the edges

Wolverine Brick and Stone Drills

Wolverine Brick and Stone Drills have internal shoulder to prevent driving strain from stripping Threads



Yes, we have Shell Drills for drilling holes in stoves, soil piping, sinks, bath tubs, hardwood flooring, etc. Listed in Catalog "C."

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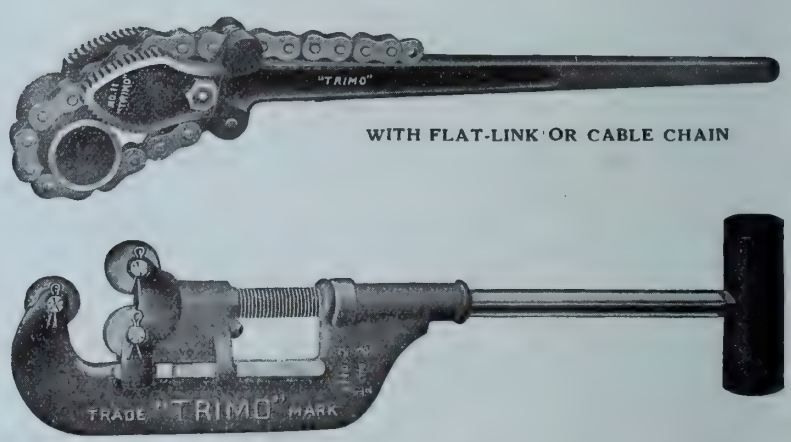
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SANITARY ENGINEER
PLUMBER AND STEAMFITTER OF CANADA

Vol. XII. TORONTO, MARCH 15, 1918 No. 6

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EDITORIALS

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SANITARY ENGINEER

VOL. XII MARCH 15, 1918 No.

Temporary Public Comfort Stations

What Pasadena, California, Does by Way of Providing Sanitary Conveniences For a One-day Holiday, an Example to be Proud of

WITH the closing of hotels, in our cities and towns, the need for public comfort stations is being felt more than ever. The very fact that no city in Canada has to date furnished more than 10 per cent of the conveniences that are necessary makes matters still worse with the closing of hotels.

Why should private corporations, such as railway and hotel proprietors furnish these public accommodations just because we are cursed with a lot of short sighted councillors, aldermen and health departments?

It is a disgrace, and what is more the medical fraternity are severely silent in the matter. Why? Simply because on the one hand they are too professionally dignified to start any public movement, and on the other, such public comfort stations would tend to present a thousand and one ills which "Human beings are apparently heir to." If such is not the case then let the medical men refute the charge. It is not sufficient that they discuss such matters in their own meeting rooms etc., or publish articles in their own medical journal advocating more public comfort stations, because the public do not read such journals. It is however, possible for them to get busy and write articles for the daily papers, but they do very little, if anything, in that direction.

The following leter from Mr. E. A. Shaver the chief inspector of Sanitary Engineering in Pasadena is very interesting. It shows what is done for the benefit and convenience of the visiting public at a one day holiday festival which is an annual event.

The illustrations are reproductions of photographs taken January 1st, 1918, and the drawings show the size and layout of the tents that were fitted up as temporary public comfort stations.

"I am enclosing photos showing how we in Pasadena are educating the people to the use of the sign. If all members of our associations would do their "bit" in boosting this emblem it would be but a short time until it would be in general use.

"On January first of each year Pasadena has a mid-winter festival known as the Tournament of Roses. At this time of the year when the eastern cities are held in a grip of ice, we in a semi-tropical climate are enjoying the flowers and sunshine After the Christmas holidays, thousands of tourists flock to Southern California, and on January first, Pasadena plays hostess to about two hundred thousand visitors who come from all over the world to see the floral parade, and to join in the afternoon and evening sports. For a city of fifty thousand to take care of a crowd of this size is no little task. It goes without saying that our permanent toilet facilities are inadequate, and that it is necessary to provide temporary conveniences.

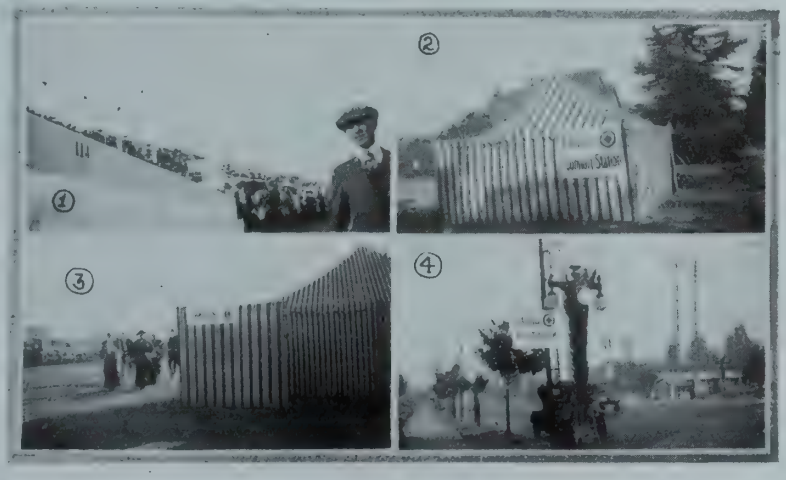
"For these temporary stations we use 14x14 tents with portable toilets In the ladies tents there are seven closet stalls, and in the men's tents there are five stalls and 42 feet of urinal trough, around three sides of the tent. These closets are built in sections like a voting booth, so that they can be put up or taken down in a very short time, and are back to back, to economize space. The closets are in the form of earth toilets, that section below the seats being lined with tar paper and discharging into galvanized iron boxes containing water and chemicals. These tanks or boxes are collected and emptied into the sewer. The tar paper is removed and burned as soon as the closets are taken down.

"The urinals are wooden frames lined with tar paper. A three foot roll of paper is used to line the trough and extends up two feet so as to make a back.

"While this equipment may seem crude, it does very well for a one-day stand, and with the competent attendants we furnish each tent, we find it answers the purpose just as well and in as sanitary a manner as a more expensive equipment.

"Eight of these tents were used on New Year's day, with an average atendance of over eight hundred per tent.

Mr. H. Y. Carson and Mr. Frank K. Chew of New York City, are working with the U. S. Army officials, trying to have them adopt the comfort station emblem for general use in army cantonments, but I do not know what success they have had in the matter. My hobby has been to get the emblem before the automobile public and have it in general use, indicating toilet facilities along our boulevards. If we can interest the automobile trade journals, makers of road maps, and those who install



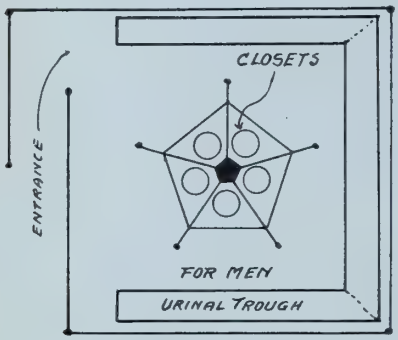
1. New Year's Day Tournament, Park, Pasadena, Cal., Army and Navy football game, 20,000 paid admissions. 2. Temporary comfort stations for women. 3. Men's Temporary Comfort Station. 4. Banner on electric light pole indicating temporary rest room and comfort station.

gasoline stations, it will take but a short time to educate the public to the use of the emblem.

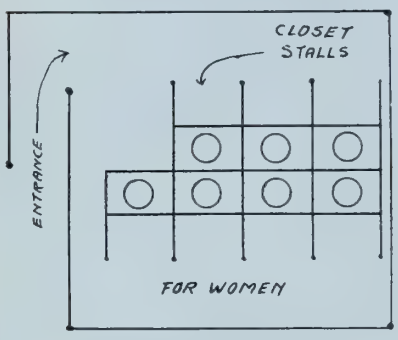
"At a later date I will try to get out a short article, with photos, showing what we in Southern California are doing in the way of boosting the comfort station emblem for 'the man with the auto.' "

What a contrast to the course being followed by the Toronto city fathers. Some time ago they felt so very large hearted as to permit the Canadian National Exhibition Board to retain a portion of the profits earned from the fees charged those who go to the exhibition day in and day out for two weeks.

The 'public be.....' is the motto of the Toronto City Council when real



FLOOR PLAN OF TEMPORARY COMFORT STATIONS.



FLOOR PLAN OF TEMPORARY COMFORT STATIONS

necessities are, or should be provided. A movement should be started to show these even their plain, common, decent duty. It is time that those insanitary places that are serving as comfort stations in the exhibition were abolished, and proper ones provided, instead of cutting down and out an appropriation that has been twice or thrice granted and then withdrawn, as the following clipping from a paper shows:

"The Board of Control, Toronto, recently decided to ask the Canadian National Exhibition Board to hand over to Finance Commissioner Bradshaw a cheque for $42,500. This amount is made up of $35,000 which the board held back to erect new lavatories at the grounds, and $7,500 voted to the widow of the late Dr. Orr."

This is two or three times that the Toronto City Council or Board of Control have changed their decisions regarding the providing of a public comfort station in the Exhibition grounds. What's the matter with the Board of Health? Why cannot a sanitary engineer be appointed on the Board of Health who will plan ways and means to provide adequate and sanitary conveniences throughout the city? For a matter of $35,000 the City of Toronto is going to be ridiculed again this year for the insanitary arrangements that are provided at the Exhibition grounds. Again we say 'what a contrast between the city fathers of Pasadena, Cal. to the Toronto Council?' "

HOW TO SAVE COAL

Governor Whitman of New York Urges Conservation—Ways of Saving Outlined, a Matter of Importance to All.

ON several occasions since the war broke out Governor Whitman of New York State has sought advice, by conference, with the editors of leading trade and technical papers on important business, manufacturing and economic problems.

Recently at his request a committee of editors of technical papers prepared a list of suggestions to manufacturers and business men and the public generally on the saving of coal. The Governor pointed out that the production of anthracite and bituminous coal would doubtless be greater than ever before, but on the other hand the consumption far exceeds the requirements of past periods, and he insists that the American people can avoid distressful conditions this winter only by exercising the greatest care and intelligence in the use of coal. The following are the suggestions which the committee prepared for the Governor.

Suggestions to Public.

The suggestions which the committee requested the Governor to make public follow:

Don't burn coal in an open grate, for in such a practice 75 per cent. or more of the heat goes up the chimney.

It isn't necessary to have every room heated. Most people would be healthier if they slept in cold bedrooms. Close off spare rooms.

Examine furnace and see that there are no cracks at floor line to permit air leakage into the ash pit. Make sure that all firing, ash pit and cleanout doors are airtight when closed.

Endeavor to keep the entire fuel space of your range or furnace filled, heaping the coal slightly in the centre. Steam or hot water boilers should be filled so that the coal is level with the bottom of the feed door opening. Don't let the fuel bed burn down too low. Thin fires mean waste. Break lumps to about egg size.

Frequent Feeding Wasteful

Feed the fire and shake the grate at regular intervals. Two or three times daily is generally sufficient unless the plant is inadequate for the service required. Frequent feeding and shaking are uneconomical. Shake down the ashes before adding fresh coal and stop shaking the moment the first bright spot appears under the grate. In mild weather let some ashes accumulate on top of the grate; in severe weather have only a very thin layer of ashes on it.

If, however, the fire has burned very low and more heat is desired open damper in the ashpit and add a small quantity of coal. In this particular case do not shake the grate until this fresh coal is well ignited, then shake down the ashes and again add fuel.

Don't leave feed door draughts open and admit cold air over a glowing fuel bed at any time. The feed door damper should be opened only to admit air over a fresh fire. Air for combustion should be drawn through the burning bed of coal and, as a general rule, all checking of draught should be accomplished by closing the ashpit damper and opening the check damper in the smoke pipe. The check damper should never be opened until the ashpit damper is closed. The shutoff damper in the smoke pipe may be closed partially in case of an unusually strong draught or to check the fire in mild weather, but, as a rule, this damper should be touched very seldom. Never check by leaving the firing door open.

Before feeding a furnace see that the shutoff damper in the pipe is open and close the check damper. This prevents the escape of dust through the feed door into the cellar.

Keep the ashpit empty. Ashes banked up under the grate prevent necessary air circulation, hinder combustion and tend to warp the grate bars. Remove ashes at least once daily, and be sure to sift all ashes to recover the good coal that has dropped through the grate.

Serious fuel wastes result from allowing soot or ashes to be deposited on the interior heating surfaces. This prevents utilization of the heat in the smoke and gases. Clean flues frequently; with soft coal every other day is none too often to give the furnace a brushing down. One-eighth inch of ashes and soot on boiler surfaces retards heat transfer 25 per cent.

A negro was recently brought into a Virginia court on a charge of larceny. After hearing the evidence, the judge pondered for a moment before passing sentence, and said:

"Rastus, you are fined $10."

Whereupon the negro replied: "Boss, dat's a small skimption. Ah got dat $10 right down in mah left-hand vest pocket."

"Well," continued the judge, "just dig down in your right-hand vest pocket and see if you can find thirty days."

Inspection of Winnipeg Private Schools

A Few Very Interesting Points Worthy of the Attention of Readers of "Sanitary Engineer"

It was thought advisable last December to make an inspection of all the private schools in the city with a view of ascertaining the sanitary conditions obtaining therein. A summary of the result shown by such inspections is here given:—

Number of private schools inspected 25
Total class rooms 11.4
Number of scholars on the rolls .. 4,080
Average daily attendance 3,720
The largest school has 480 scholars and the smallest 7.

Kind of School

German Lutheran	3
Hebrew*	3
Ladies Colleges	2
Kindergartens	5
Greek Catholic	1
German Catholic	1
English Catholic	4
French Catholic	1
Polish Catholic	2
Boys' Preparatory	2
Icelandic (Secondary)	1
Total	25

*Open after school hours for religious instruction.

The business colleges have not yet been inspected.

Lighting

The relation of the size of the windows to the floor areas of the class rooms ranged from one-third to one-twentieth. In schoolrooms the windows should equal at least one-sixth of the floor area. Only 22 class rooms came up to this standard. Taking one-tenth (the standard required in rooms in dwellings), we found that 67 class rooms had this amount of glass or more. Only ten class rooms had less than one-fourteenth. The best lighting was found in the Greek Catholic school, where all the windows equalled one-fourth of the floor areas. Light should reach the scholars over the left shoulder. It was found that in 80 class rooms the desks were arranged so that the light came from the left or from the left and rear. In only three rooms were the scholars found facing the light. By turning the desks round it was found possible in some cases to obtain light from the proper direction.

Ventilation

In 19 schools the ventilation is by means of windows exclusively, and in six others this is assisted by ceiling or wall vents, none of the private schools having a mechanical system of ventilation. In eight schools the upper sashes of the windows were fixed and could not be opened. It is very necessary that all schoolroom windows should open at the top in order that the upper portions of rooms may be properly ventilated. In three schools we found that the storm sashes were fixed and had no means of ventilation other than the grossly inadequate auger holes at the bottom of the sashes.

Floor Space

This was found to vary from a minimum of 8 square feet per scholar to a maximum of 136 square feet per scholar (in one room only). Taking 16 square feet per scholar as a desirable standard, we found that 43 class rooms had less than 12 square feet per scholar, and 12 rooms less than 10 square feet per scholar. This means overcrowding.

Cubic Air Space

This ranged from 81 cubic feet per pupil to 1,640 cubic feet per pupil (in one room only). Taking 200 cubic feet per pupil as a reasonable standard to be required, we found that 52 class rooms out of 114 measured fell below this standard; 36 went below 150 cubic feet per scholar; 18 below 125 cubic feet, and 6 rooms were found in which each scholar had less than 100 cubic feet. This also indicates overcrowding.

Sanitary Conveniences

The number of water-closets provided were from 1 fixture for every 12 scholars to 1 for 50. The number specified by the Health By-law is one water-closet for every 20 scholars.

Eight toilet rooms were in good condition; 11 toilet rooms were in fair condition, and 5 toilet rooms were in dirty condition.

One school was found where no toilet was provided, and the children had to go over to a branch of the school in another building. In three schools old-fashioned trough closets were in use. These were flushed with a tin hopper and were almost invariably in a more or less dirty condition. They are very objectionable.

Cleonliness

Most of the schools were found to be kept in a very cleanly condition. They might be classified as follows:—

Good	16
Fair	7
Poor	2
	25

We found common drinking cups in use in three schools and common towels in two schools.

Pencils were used in common in two schools.

The authorities of each school have been notified regarding any defects or insanitary conditions existing, and also advised as to the best methods of rectifying the same.

The common cups, towels and pencils will be abolished forthwith. Windows and storm sashes will be altered, and plumbing defects rectified. The principal difficulty arises in connection with overcrowding. If the institutions maintaining these schools, accommodating over 4,000 scholars, are suddenly required to considerably reduce the number of scholars admitted, it means either that a large number of children must stay home or have extra accommodation provided for them, either by enlarging the schools at present overcrowded, or in the public schools, which are already full. In some of the foreign schools we noted a number of very young children, who appeared to be sent to school to be taken care of whilst their mothers go out to work.

It is intended to make periodical inspections of these private schools, it being evident that in some cases better supervision and instruction is required in such matters as:—

The proper maintenance of adequate ventilation by the judicious use of windows:

The maintenance of suitable temperature and humidity in the class-rooms; the care of the lavatories; cleanliness, etc.

The overcrowding will be reduced by degrees but as rapidly as possible.

FOURTH TIME ROUND

While no doubt there is a very serious side to the way many power plants are being operated on this continent, once in a while there is the humorous side too, as is proved by the following story.

Away back in the timber districts of one of the southern states a fairly large lumber mill was in operation. A big steam engine and boiler furnished the motive power, and a nigger was in charge of the boiler. A city man was visiting the lumber mill with a view of buying lumber, but as the owner was not just then on the premises the visitor took a stroll round.

There he saw the big 12 foot fly wheel of the engine going round, and the engine without any apparent great effort turning all the machinery.

Stepping to the front of the boiler, and looking up at the pressure gauge he noted that it only registered 25 lbs. pressure.

Turning to the nigger he said: "Say Sambo, you've got a mighty fine engine there, turns all that machinery with only 25 lbs. of steam behind it?"

"Well bo, yo wouldn't think so ef yo jes hed to shovel in all da coal, slab wood and all that, that I hed to handle to her. Dat clock up dere don't mean notting, she's gone four tarms round boss, four tarms round.

SANITARY INSPECTORS APPOINTED

Edmonton, Alta.—The Alberta Government has adopted new measures to improve sanitary conditions in the small towns and villages of the province. Two new sanitary inspectors have been appointed to travel through the country and make inspections. These inspectors are two returned soldiers who have had special training for their work.

The Line of Least Resistance

Moses Irons Entertained a Customer from Clay Hollow, Minnesota, and Gets Track of a New Way to Add Thousands of Dollars to His Profits—You'll Find a Sound Practical Lesson in This Business Fiction Story

By Danield Louis Hanson. Illustrated by Charles D. Mitchell.

By the courtesy of "System," the Magazine of Business.

(Continued from last issue.)

"I MEAN that 95% of all sales managers havent," insisted Jessup, getting up from his seat on the baggage truck and taking a turn up the platform alongside the narrow-gauge track. "I go out and sell a $50,000 order tomorrow and the next day a $30,000 one, when the high record up till those two days has been $1,000. Do I get credit for that second day of $30,000? No. I am found fault with for not having come up to my own record of $50,000 of the day before. Now that illustrates how sales management sometimes operates.

"Out in this farm country, if a horse takes a long journey, or has an unusually big day's work on Monday, they make it easy for him the next day. That is conservation of energy. But your sales manager this land over doesn't practice that common-sense method; he prods with the spur, he lashes with the whip, and then he talks about his sales 'management'!"

"But as to these small towns?" suggested Moses Irons, diverting Jessup's remarks to the question before the house.

"Make it an object to cover these towns once in so often—it needn't be every 30 days—possibly once in 90 will do it. Then allow us something additional in the way of commission. In a town like Clay Hollow is isn't a question of walking in and booking an experienced buyer's order. Instead, as you have seen, a man has to go from house to house, very often, and sell the jobs for the dealer till he gets his hand in. And, unfortunately, that time never arrives with some dealers."

Moses Irons always regretted that the narrow gauge was on time that day, for because of it he lost some precious nuggets out of the stock William Jessup seemed to have on hand. But still he had secured a number.

"There is no question, John," said Moses Irons the following day as he and Renwick sat in conference, "but that some method must be adopted to conserve our business in the small towns. It's a big business in the aggregate already, and can be increased manyfold."

"We could put in a class of junior salesmen to look after them," suggested Renwick, never slow to increase the sales force.

"It is hard enough to keep what few men we have there these days—and if the war hits us we may be running with half a force at that. Besides, the small town needs our best sales efforts; there the salesman has to reach through the dealer to the ultimate consumer. So it was in Clay Hollow, and so it is elsewhere. It is easy comparatively to sell up in the Twin Cities, say, where the buyers know their needs and seldom ask the salesman's help in putting through a deal. There the consumer is being incited to buy the latest by seeing his neighbors have it, or by wanting to go them one better. But the small town is without this community incentive or competition. The dealer is without the spur of other dealers who go him better, the consumer is without it. No, our best salesmen, for a while at least, must make these small towns."

"They are already overcrowded with work and this will mean more than doubling it," grumbled the sales manager.

"Over in Massachusetts I had a horse named Rajah," said the ironmaster with the air of one who speaks in words of one syllable. "Rajah was a hard worker, up to what he thought was his limit. Beyond that limit neither whip nor spur could move him. He wasn't balky—he had simply reached his limit. Then I would get a lump of sugar—sometimes it took two—and old Rajah would move on to a lot more work. Now suppose we put our salemen on a 90-day schedule in such towns as Clay Hollow, and give them a 3 per cent commission on all the direct sales made in such places in addition to their salaries. Then the mail order business, which will be heavier from the small towns, where salesmen from our competitors don't go, than in the cities where the buyer has a selling agent at his elbow all the time, will be ours to make up on."

"I don't like the principle of the thing," said Renwick decidedly.

"Nor did I at first like that sugar scheme with old Rajah. I felt that he should give me that extra effort out of pure loyalty to me. But after a time I saw that Rajah was right; he had done a fair amount of work when he reached his stand-still stage; anything beyond was extra on his part. Why should not I also give something extra as the price of his extras? I was buying his loyalty. Did you ever know of genuine loyalty that wasn't bought at a fair price??"

"But—"

"I bought loyalty from Rajah in the way of extra service. He bought loyalty from me in the way of two lumps of sugar. I gained by the transaction, as we will gain from one I am suggesting. Now you and I have to indulge in more intensive selling—we can do that only through the agency of our men in the field. We can lay aside the negligible amount that we get through the loyalty. We don't hesitate to put a cutting edge on the tool. Why do you hesitate in getting loyalty as part equipment for our men? There always has to be a consideration, John. Show me the man who will go out and work for us regardless of what he gets and I'll suggest that you get rid of him at once; he isn't safe to have handling our affairs."

"Of course it's your game!" and Renwick leaned back in the chair.

"Yours and mine, John; you are dealing, I am buying the chips, both of us are going to sit in. We have got to get in on this small town business—the towns which are going to be the most prosperous, for they are the closest in touch with what is going to be more and more the real source of wealth, the soil. We have tried spasmodically for years past to get into them—others have tried probably with the same amount of success. We wanted all the juice and we got practically none of it. Now let us try this other scheme; pay our way like men, not sponge on our salesmen, and I am sure that there will be results—a jackpot to divide, John."

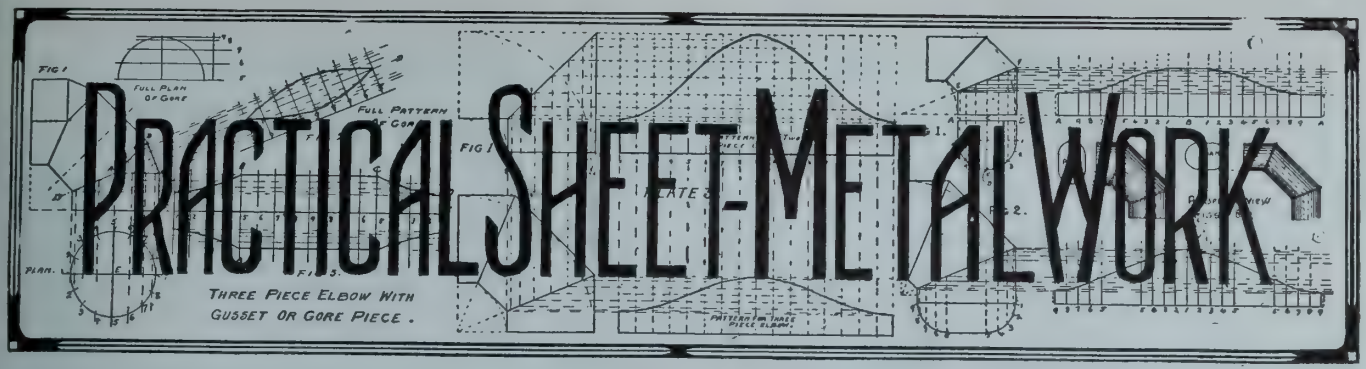
Renwick got to his feet slowly, a sign that he was subdued but still unconvinced. Moses Irons looked at him quizzically, and added:

"A sales force is a sort of battery—a human battery. Once in so aften you have to test the various cells and add something or other. All the cells have to work or else you don't get a full result. One great trouble is freezing, John. If you get too low on the hydrometer scale there is apt to be trouble. Add more pure water and run the engine for a while to re-charge it. That is all you have to do, John. Let me see your layout of the plan in the morning."

CANADA ATTRACTS SOLDIERS

Many Veterans of the European Conflict Will Cross the Seas to Share in Development of the Dominion After the War

"There will be many time-expired men from my regiment who will want to come to Canada when the war is over," writes Major D. Hector Pearson, of the MacLean Publishing Company's staff, who is now a prisoner of war in Turkey. Major Pearson's words bear out the belief, which gains strength from every camp and fighting front, that after the war the hardy men who have held the lines against the Hun will still want to be in the forefront of the economic battle called "after-war trade." Canada's place in that fight, as in this, is over the top every time, and the attractions of the Dominion for the soldier-spirit are immense. Immigration will certainly result.



BY THOMAS STANFIELD

IN this article is shown how the patterns for a round to oblong offset are developed. There are several methods, more or less complicated, but the student will find this method very simple, and with fewer useless details to trouble him.

First of all, the elevation must be drawn to exact size, as shown in Fig. 1, and the usual method followed out for developing the large round piece and small oblong piece as is followed when developing the regular elbow patterns.

Possibly, however, some of our readers would be interested in having full and complete instructions. Therefore, the next step to follow will be to draw the two lines A, B, C, D, E, F, which are part of the elevation, from these lines drop other lines at right angles with which to draw the two plans.

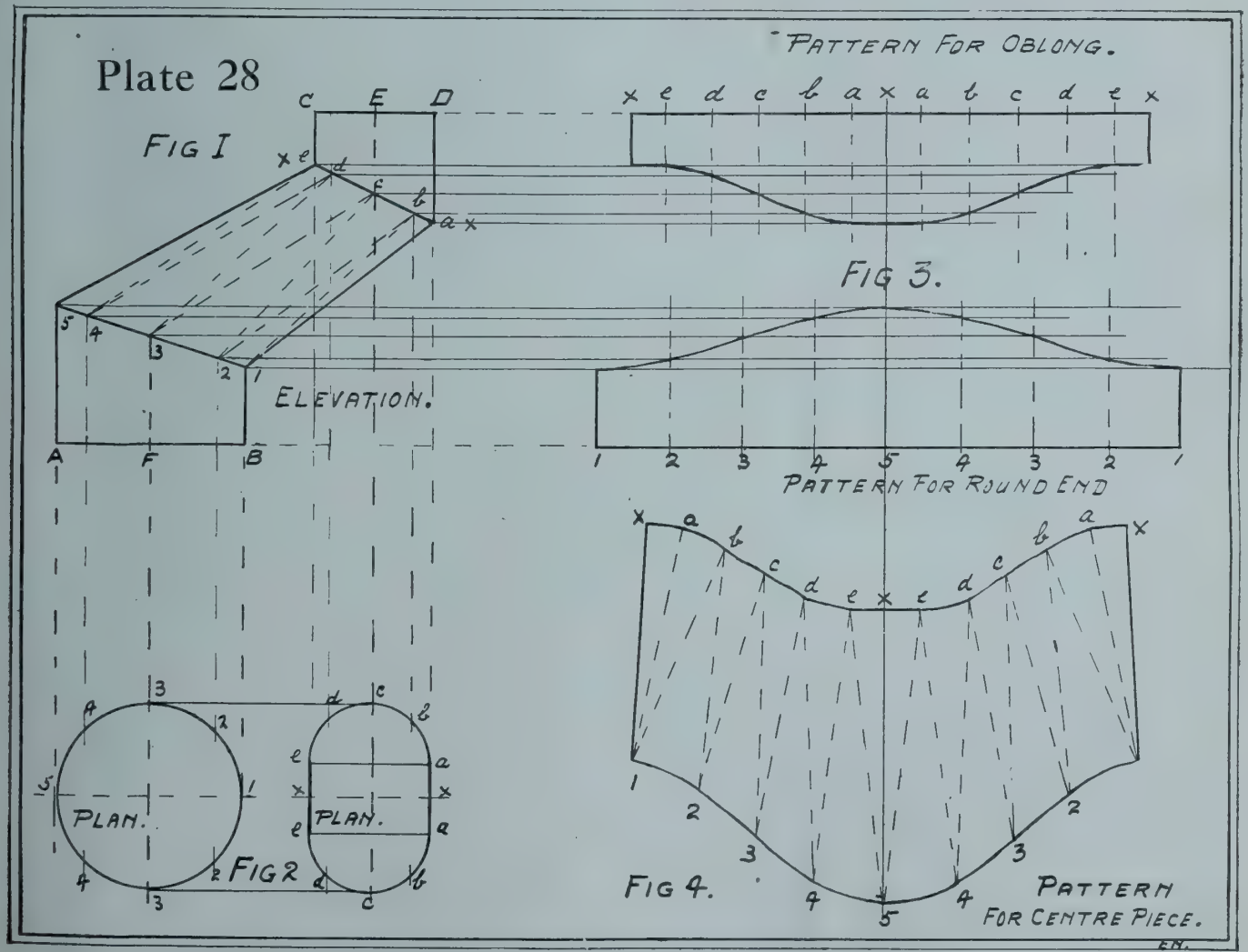
It would be complicating matters to attempt to draw plan of centre piece, and as it is really not necessary we will proceed with the patterns.

Divide the plans (Fig. 2) off as shown at 1, 2, 3, 4, 5, for the round large end and a, b, c, d, e and x in oblong plan. It will be seen in the latter plan that between e, x, e and a, x, a are two straight portions, the rest of the plan is two true half circles.

From x, a, b, c, d, e and 1, 2, 3, 4, 5 must be drawn a number of straight lines parallel to each other as shown from the mitre lines in Fig. 2 to Fig. 3, and extend the solid lines C, E, D and A, F, B, the two latter lines being base lines for patterns of oblong top and round bottom pieces.

Now transfer the various measurements which are shown and marked off in the two plans Fig. 2, beginning at X in the centre of Fig. 3, and working to each side. Where these measurements intersect the horizontal lines, draw cur-

(Continued on page 30.)



Overhead Expenses and Profits

Being the Third Address Given at the Regular Monthly Meeting of the Toronto Society of Domestic, Sanitary and Heating Engineers on Overhead Expense and Profit

By Garrett F. Frankland, Secretary of the Ontario and Toronto Societies of Domestic Sanitary and Heating Engineers.

IN resuming my series of talks on overhead expenses and profits as experienced in the plumbing and heating business, I would just for a moment revert to the table or chart that accompanied my talk No. 2, entitled "Table for Figuring Net Profits." If you did give this table any consideration, or if you went further and proved that the figures set out in the table were correct, then I shall number among my fellow craftsmen others in addition to those who have already realized that before profit is made overhead expense has to be taken care of, and also that when 25 per cent. is the amount agreed upon as our overhead cost, we must add to the prime or invoice cost of the wholesaler or manufacutrer a percentage of 50 per cent, before we dare count on a profit of 8 per cent.

How many in our craft to-day could at a moment's notice, give a correct answer to the following query? How much will a 30-gallon range boiler have to sold for to assure a 10 per cent, profit over and above overhead cost of 25 per cent? I venture to say the number would not be legion who would repuly $21.56. Yet this is the amount that should be quoted to-day on a 30-gallon range boiler costing fourteen dollars wholesale, if you are to turn a profit of 10 per cent. after paying your overhead cost of doing business which is 25 per cent., or in other words you will need to add 54 per cent. on to your invoice cost to net you your desired 10 per cent. profit on this particular sale.

To ascertain the required answer to the above query I will give my way of finding the answer shown, and with a little study you will find that the method is both simple and accurate and is adaptable in all cases no matter what your particular figures may be.

Firstly we naturally assume that you have the invoice or first cost of whatever article you wish to quote on. Secondly we must assume that you know what is the amount of your overhead expense, same being based on your turnover of the previous year.

Thirdly we know what is the amount of profit that you desire. And do not overlook the fact that when I say profit I mean just what the word implies, viz., the monetary gain you are to realize when everyone also has received his portion, and your savings bank balance has increased by the amount added on and styled profit.

Number one is invoice cost of boiler at $14.00.

Number two is overhead expense at 25 per cent.

Number three is profit desired at 10 per cent.

Total the percentages 25 per cent. and 10 per cent giving you 35 per cent.

From 100 per cent. deduct 35 per cent. leaving you 65 per cent.

Multiply $14 by 100 and divide by 65 and you get $21.54.

That is your selling price, with the desired percentage of profit.

Arithmetically we should express it:

$$\frac{\text{original cost x 100 divided by 65}}{\text{selling price.}}$$

In outlining the above example I realize that until the majority of those engaged in our line of endeavor are competent to conduct their business on proper lines, and do make certain that all branches both pay and take up their proper share of the burden of cost of doing business, we will necessarily have to meet objections to our contentions of the amount necessary to be added to our merchandise before we secure profit, and in using these different charts or tables I do so in the hope that more will be converted to the

(Continued on page 27.)

Table Showing Percentage of Cost Which Must be Added to Effect a Given Percentage on Sale

The Percentage of Profit Should Always be Figured on the Selling Price and Not on the Cost

5%	Added to Cost	is	4¾%	Profit	on	Selling Price
7½	"	"	7	"	"	"
10	"	"	9	"	"	"
12½	"	"	11⅛	"	"	"
15	"	"	13	"	"	"
16 2-3	"	"	14¼	"	"	"
17½	"	"	15	"	"	"
20	"	"	16 2-3	"	"	"
25	"	"	20	"	"	"
30	"	"	23	"	"	"
33 1-3	"	"	25	"	"	"
35	"	"	26	"	"	"
37½	"	"	27¼	"	"	"
40	"	"	28½	"	"	"
45	"	"	31	"	"	"
50	"	"	33 1-3	"	"	"
55	"	"	35½	"	"	"
60	"	"	37½	"	"	"
65	"	"	39½	"	"	"
66 2-3	"	"	40	"	"	"
70	"	"	41	"	"	"
75	"	"	42¾	"	"	"
80	"	"	44½	"	"	"
85	"	"	46	"	"	"
90	"	"	47½	"	"	"
100	"	"	50	"	"	"

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VOL. XII. MARCH 15, 1918 No. 6

A HEATING BY-LAW

FOR some time the question of a heating by-law has been given some thought by the Toronto city fathers. This worthy body instructed City Architect Pearse to draft a heating by-law and, of course, he has assumed the duties of "doing as he is told" in spite of the fact that he is not a heating engineer. It is to be hoped when the by-law comes up for consideration that it will be a practical one.

Some two years ago Mr. Pearse drafted one and we have learned that it was sent to the executive of Local 46, Journeymen Plumbers and Fitters of Toronto, as well as to the Toronto Society of D. S. & H. E. It was also learned that certain alterations were made to it, but in actual fact, we have every reason to believe that these two bodies of practical men must have handed it back in utter disgust, proving that no one can make a rotten tree grow, you can't do it. If City Architect Pearse is really anxious to give practical service to Toronto's citizens, he will re-draft the building by-law, not merely from a structural standpoint, but also to make buildings wind and weather-proof.

The writer has just returned from a visit to a number of cities in the United States and has found that houses are more like sieves, that a great deal of fuel is wasted because they are not more substantially built. Not only has there been a shortage of coal as fuel, but in almost every district where natural gas is used for heating buildings there has been a shortage of gas.

The Ohio Gas Co., Cleveland, are at present under fire as a result of the gas shortage in that city, and for remedy the company is asking for permission to raise the price, stating that by so doing gas will not be wasted, as it apparently is now.

Quoting another reason why the consumption of gas in Cleveland has taken such a jump, Mr. Daly, the president of the Ohio Gas Co., stated that poor construction of houses in Cleveland was one of the factors entering into the heating problem there each winter.

"Most of the houses in Cleveland were cold before they were built," he maintained. "They were built to sell—for the purpose of making a profit—and there is no fuel that can heat them."

This is just the trouble in Toronto, and unless there is a law put into force demanding that houses be made wind and weather proof, no amount of heating will remedy the trouble. What is the use of trying to heat buildings that are almost as cold inside as outside.

We would suggest that the architect attend to his end of the business, and when asked by the council to assume a responsibility which does not come under the term of architecture, he should inform them of that fact.

We know he is a very capable architect, and in that capacity has no doubt been of splendid service to the city of Toronto, and we believe he can draft a building by-law that will require houses and buildings to be built so as to be less difficult to heat, and by so doing can save the citizens of Toronto the price of thousands of carloads of coal.

BRITISH EXPORT TRADE

THE chairman of Messrs. J. Mandleberg & Co., Ltd., Pendleton, Manchester, has placed before British manufacturers and producers the outline of an interesting scheme on natural lines for the direct encouragement and development of British export trade.

The main proposal is to organize British manufacturers and producers into a national body for the specific purpose of securing more orders from overseas. The method proposed is to make available for all firms in the new British Manufacturers' Corporation, which is the title suggested, the means which business experience shows to be most effective in developing foreign trade. This is the employment of representatives abroad—men of first class ability and possessing thorough knowledge of the business conditions in the different foreign countries to which they will be appointed and where they shall be resident. They will be known, it is suggested, as agents in charge. They will find and appoint the right men as local selling agents for individual firms, get first news of fresh trade openings, report on the standing of possible customers, and generally superintend the business interests of all the firms in the organization.

The promoter of the scheme contemplates an organization of a thousand members subscribing £100 or £200 a year. With a fund of £100,000 or 200,000 a year, it is suggested, strong inducements could be offered to likely men to be agents in charge. The latter would be assisted by a competent staff of experts and a code system could be devised to facilitate prompt communication.

Power of Suggestion in Advertising

Every Advertisement Should Contain Some Real Information For the Reader—Particularly Such Advertisements as Are to be Read by the General Public

IT is encouraging to note when reading the various daily and weekly newspapers that the number of those members of the trade that are advertising is continually increasing. Many, too, have given the advertising problem much thought, or such advertisements as are appearing in the daily press would not contain the amount of valuable information that they do.

There is no information in an advertisement that merely tells a person that you are in the plumbing and heating business, that you employ the best men you can procure, etc., and that you instal only the best material you can buy.

Just reason this out in your own mind, Mr. Reader, and ask yourself this question: "What good does it do me to know that Brown employs the best men he can get?" As a matter of fact the best you can get may be very poor. It is the same with the material. Possibly if you had more cash on hand you could buy better material, but as you are short of cash you may buy the best your stock of cash will permit, so, you see, that does not prove anything does it?

But there are other things you can and should consider when writing your own advertisements, you should always give the reader some real information that is valuable to him whether he patronizes you or not.

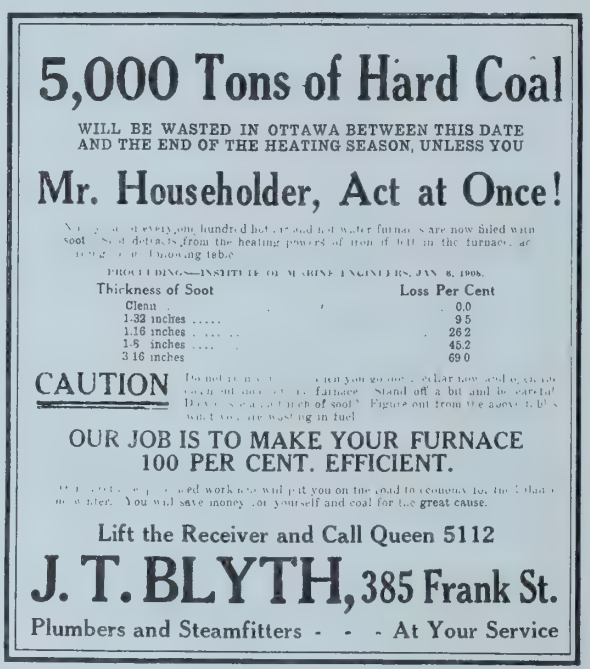
For example here are two good advertisements in facsimile. The original size of the smaller one was 6¼ x 7¼ inches, the larger one measured 6¼ x 10½ inches.

The first line in the smaller advertisement is of interest just to catch the eye. The reader's attention is caught first of all by the words "5,000 tons of hard coal," and of course he must read on. By so doing he is given some real information, is told that 5,000 tons of hard coal "will be wasted in Ottawa between this date and the end of the heating season, unless you, Mr. Householder, act at once."

There's some real information and every word is true, in fact if anything those figures are below the mark.

But the reader of such a statement is now becoming more interested. There is no sign of wanting to sell anything to the reader. Some real information has been given and his attention is still held, particularly because at a glance there is to be seen still more valuable information. "Ninety out of one hundred hot air and hot water furnaces are now filled with soot. Soot detracts from the heating power of iron if left in the furnace, according to the following table:" (Read table shown in advt.)

There is only one criticism to be made concerning this table and that is that it refers to proceedings which took place in connection with the Institute of Marine Engineers, in Jan. 6, 1908.



5,000 Tons of Hard Coal

WILL BE WASTED IN OTTAWA BETWEEN THIS DATE AND THE END OF THE HEATING SEASON, UNLESS YOU

Mr. Householder, Act at Once!

Ninety out of every one hundred hot air and hot water furnaces are now filled with soot. Soot detracts from the heating powers of iron if left in the furnace, according to the following table

PROCEEDINGS—INSTITUTE OF MARINE ENGINEERS, JAN. 6, 1908.

Thickness of Soot	Loss Per Cent
Clean	0.0
1-32 inches	9.5
1-16 inches	26.2
1-8 inches	45.2
3-16 inches	69.0

CAUTION Do not let your coal dealer tell you [illegible] Stand off a bit and be careful! Don't be satisfied with much of soot? Figure out from the above table what you are wasting in fuel

OUR JOB IS TO MAKE YOUR FURNACE 100 PER CENT. EFFICIENT.

[illegible] work will put you on the road to economy for the [illegible] You will save money for yourself and coal for the great cause.

Lift the Receiver and Call Queen 5112

J. T. BLYTH, 385 Frank St.

Plumbers and Steamfitters - - - At Your Service

Facsimile of advertisement which appeared in an Ottawa daily paper.

There was really no need to refer to these proceeding. It would appear to the uninitiated that marine boilers were being taken as a basis for arguments. The fact of the matter is just such evidence and proofs have appeared in SANITARY ENGINEER, and many other trade journals connected with the heating trade, and there is a danger of some readers concluding that such figures **may not** apply to house heating furnaces. As a matter of fact the figures are if anything below the mark.

House heating boilers and furnaces are the most wasteful in fuel of any type of furnace, in spite of the fact that they are specially constructed to give the maximum heat units from the fuel consumed.

It will be noted that so far the advertisement has given some real information. It has shown that a lot of fuel is going to be wasted, etc. It has shown how and why.

The remainder of the advertisement now takes another "tack" It shows how this fuel waste can be prevented. It asks the reader to go and look at his furnace and judge for himself whether his furnace needs some practical attention.

That practical men should be given this work is proved by the fact that scores of times men have been called in to see furnaces and explain why they were not giving off the heat expected of them and these men have found that while the most easily accessible parts have been cleaned out by the owner or occupant of a home, the most vital parts have been found simply clogged up tight with soot or other matter.

No ordinary person can be expected to know the interior construction of such an important appliance, when as a matter of fact it has required the best brains engaged in furnace construction to bring this type of furnace to its present state of perfection.

Now turn to the larger advertisement. This followed the former one referred to, but could have been made much more valuable as well as more striking. to the reader.

In the first place the question, "Why not buy a furnace bond?" should have appeared at the top as the heading followed by the next paragraph in larger black faced type.

The two top lines would have made a good "closer" if they had been placed at the foot of the advertisement.

The whole advertisement is full of information of value. There is only one "investment" which we not quite agree with and that is the third.

If Mr. McHenry's advice is worth anything—if it is of real value to the person who receives it, it is worth paying for, and the sooner the whole trade adopts a "charge for advice policy" the sooner will such advice be appreciated.

When Mr. McHenry reports that Mr. Brown's furnace is in bad shape, he is no doubt telling the truth. But 90 per cent. of the public will view the advice given with suspicion. Deep down in the mind of the person who receives that advice is the firm conviction that Mr. McHenry is looking for a job, and the person is on his defensive. He doubts the value of the advice in spite of its truthfulness, and forthwith calls in another man to report.

We would call our readers' attention to the article appearing on another page entitled "Time is Money." In conclusion we wish to emphasize that the trade will do well if they will make certain cash appropriations every three months

at least to be devoted to advertising, but remember that the public are not interested in being told that you "Employ the best men," or that you instal "the best material." But rather are they more interested in knowing how they can profit by giving you the work to do. In a nutshell, use the local paper in telling your side of the story because when any one takes up and reads what appears in the pages of any paper, particularly when he has paid for that paper, his mind is in a receptive mood, but when you try to show in words the how and why and your listener gets that advice free, he is at once on his defensive, and is not in as receptive a mood as when sitting quietly and absorbing the contents of something he has bought and paid for.

Now, let us turn to the first mentioned advertisement on opposite page. In words there is no suggestion to buy anything. A statement is made that 5,000 tons of coal will be wasted, etc., "unless"—unless what? Unless you, Mr. Householder, act at once. There is a suggestion to act, to do something, so that each reader of the advertisement may do his or her share to save a portion of that 5,000 tons of coal, which, by inference, means that each person will save money for themselves if they act in a certain way, viz., call in an expert to examine the furnace, etc.

The whole advertisement suggests that the reader first call in one of the advertiser's men and guarantees to make an improvement in the heating capacity of a defective, overloaded or dirty furnace.

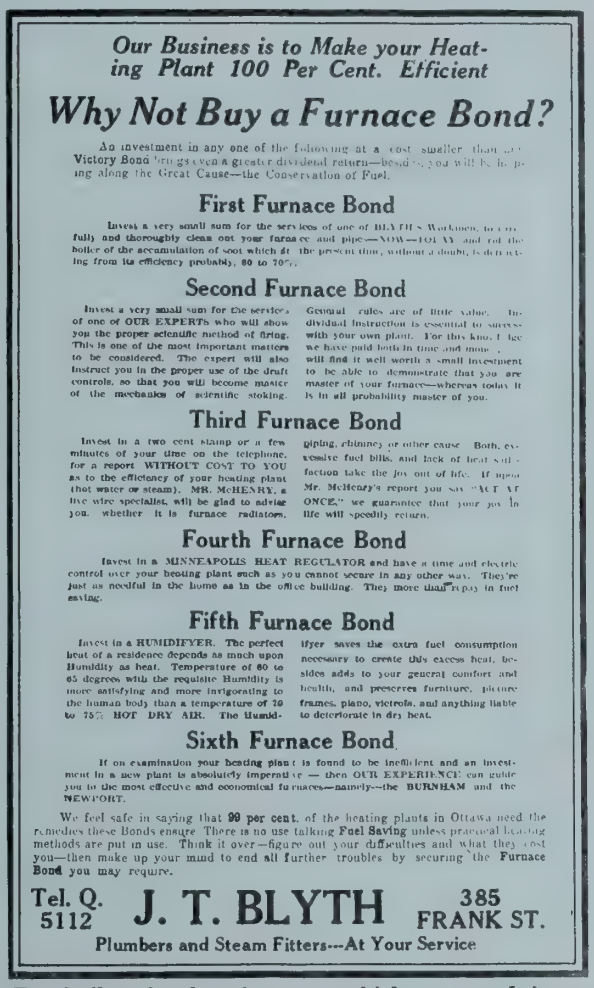
If the reader happens to be of a patriotic turn of mind, it will at once be very apparent that to save coal is conserving this continent's natural resources, relieving transportation to a certain extent, cartage, etc., and at the same time making the heating apparatus much more efficient. The whole advertisement suggests merely the buying of labor.

But we find that the advertisement on this page is rather of a different type. There are several suggestions to buy goods. For example, the "fourth furnace bond." It is suggested that the reader invest in a Minneapolis heat regulator, and then goes on to state why, because by so doing "you will have control over your heating system night and day." Not only so, but the reader is told that such an appliance must be acquired if absolute control over one's heating system is required, and then the fact that a great saving of fuel can be effected if a heat regulator is installed is very convincing. It would, however, have strengthened this suggestion to buy if a few figures had been given as to saving of fuel, because it is well known that as high as 30 per cent. in coal has been saved, which means that in a house where 10 tons of coal is consumed in a winter season, three and one-third tons of coal has been known to be saved.

The cost of one of these regulators, we believe, is around $65 installed, and even if 20 per cent. of a saving could be made the appliance would pay for itself in say about three winters. Then there is the comfort and convenience.

The fifth suggestion is almost of sufficient importance to have been given a whole advertisement, but the information is good, convincing, and suggests strongly the need for humidifying appliances in connection with every heating system.

The public requires to be told more and more about humidity and its importance to health. The writer has proved that actual cases of bronchial trouble have been cured by having humidifying appliances equipped to the heating system. Sanitary and heating engineers have a big duty to perform in doing their bit to educate the general public along these lines, and no doubt when more efficiently equipped heating systems become the rule rather than the exception, the labors of our craft as a whole will be appreciated to a greater extent.



Our Business is to Make your Heating Plant 100 Per Cent. Efficient

Why Not Buy a Furnace Bond?

An investment in any one of the following at a cost smaller than any Victory Bond brings even a greater dividend return—besides, you will be helping along the Great Cause—the Conservation of Fuel.

First Furnace Bond

Invest a very small sum for the services of one of BLYTH'S Workmen, to carefully and thoroughly clean out your furnace and pipe—NOW—TODAY and rid the boiler of the accumulation of soot which at the present time, without a doubt, is detracting from its efficiency probably, 80 to 70%.

Second Furnace Bond

Invest a very small sum for the services of one of OUR EXPERTS who will show you the proper scientific method of firing. This is one of the most important matters to be considered. The expert will also instruct you in the proper use of the draft controls, so that you will become master of the mechanics of scientific stoking. General rules are of little value. Individual instruction is essential to success with your own plant. For this kind of service we have paid both in time and money . . . will find it well worth a small investment to be able to demonstrate that you are master of your furnace—whereas today it is in all probability master of you.

Third Furnace Bond

Invest in a two cent stamp or a few minutes of your time on the telephone, for a report WITHOUT COST TO YOU as to the efficiency of your heating plant (hot water or steam). MR. McHENRY, a live wire specialist, will be glad to advise you whether it is furnace radiators, piping, chimney or other cause. Both excessive fuel bills, and lack of heat satisfaction take the joy out of life. If upon Mr. McHenry's report you say "ACT AT ONCE," we guarantee that your joy in life will speedily return.

Fourth Furnace Bond

Invest in a MINNEAPOLIS HEAT REGULATOR and have a time and electric control over your heating plant such as you cannot secure in any other way. They're just as needful in the home as in the office building. They more than repay in fuel saving.

Fifth Furnace Bond

Invest in a HUMIDIFYER. The perfect heat of a residence depends as much upon Humidity as heat. Temperature of 60 to 65 degrees, with the requisite Humidity is more satisfying and more invigorating to the human body than a temperature of 70 to 75% HOT DRY AIR. The Humidifyer saves the extra fuel consumption necessary to create this excess heat, besides adds to your general comfort and health, and preserves furniture, pictures frames, piano, victrola, and anything liable to deteriorate in dry heat.

Sixth Furnace Bond

If on examination your heating plant is found to be inefficient and an investment in a new plant is absolutely imperative — then OUR EXPERIENCE can guide you to the most effective and economical furnaces—namely—the BURNHAM and the NEWPORT.

We feel safe in saying that **90 per cent.** of the heating plants in Ottawa need the remedies these Bonds ensure. There is no use talking **Fuel Saving** unless practical heating methods are put in use. Think it over—figure out your difficulties and what they cost you—then make up your mind to end all further troubles by securing the **Furnace Bond** you may require.

Tel. Q. 5112 **J. T. BLYTH** 385 FRANK ST.

Plumbers and Steam Fitters---At Your Service

Facsimile of advertisement which appeared in an Ottawa daily paper.

NEW HOTSTREAM REGULATOR

A new line of thermostatic gas controlling gas devices is being placed on the market by the Hotsteam Heater Company, Cleveland, Ohio. The following are a number of exclusive features that are claimed:

All working parts are of brass, all be adjusted on a cold tank within a adjustments made from outside, can be adjusted on a cold tank within a minute's time without shutting off the gas, will seat in any position, no stuffing boxes or gaskets, nothing to stick or cause friction, flush connection between valve stem and non-expansive rod—impossible to strain any part, extra cold water supply through thermo, beautiful dull black finish, one-half-inch gas connection.

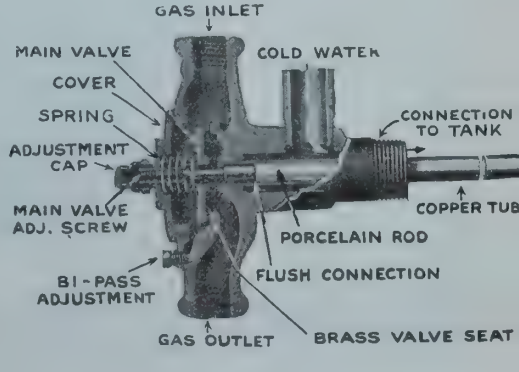
Construction and Operation

The manufacturers claim that this regulator will operate equally well in any position. As soon as the water in the range boiler is heated down to the Regulator, the main valve will close due to the expansion of the copper tube, leaving the pilot light burning.

When water is drawn, cold water entering the tank contracts the copper tube, which in turn opens up the main gas valve, and the heater will then gurn until it has heated as much water as has been drawn and will then again shut off.

The pilot takes care of any heat lost through radiation so that the tank is always full of hot water.

Further particulars as to prices, etc., may be produced from their Canadian representative ,W. H. Cunningham, 98 Kingswood Road, Toronto, or direct from the manufacturers.



Some Straight F
About The Newport Ma
(Made By The

LET us point out to you, point by point, just why this latest addition to Burnham Boiler family—The Newport Magazine Feed Type of Boiler—is more economical than the average magazine feed boiler. Easier to operate. More dependable. Note illustration in the center. Compare the point-out points with this line-up:

(1) *Double Capacity Magazine.* Coaling necessary only once a day in coldest weather. Only twice a week in ordinary winter weather.

(2) *Adjustable Water-cooled Throat.* Makes it possible to burn any size coal. An *exclusive* Newport feature.

(3) *Simplified Two-piece Grates.* More ashes accumulate at lower edge of sloping grate. Greater agitation required. To secure this, the Newport Two-piece Grate-bar is so arranged that the lower half rocks a certain distance before the upper half is engaged. A short stroke of shaking handle disturbs only the lower half of the fuel bed. A longer stroke will move the upper part as well.

(4) *Combined Side Grate and Connecting Bar.* The bar is placed above the grate. The forward and backward motion of this bar serves to rock the sloping bars and by its shearing action, thoroughly clears the lower edge of the fire. The entire grate is cleaned without any waste of fuel.

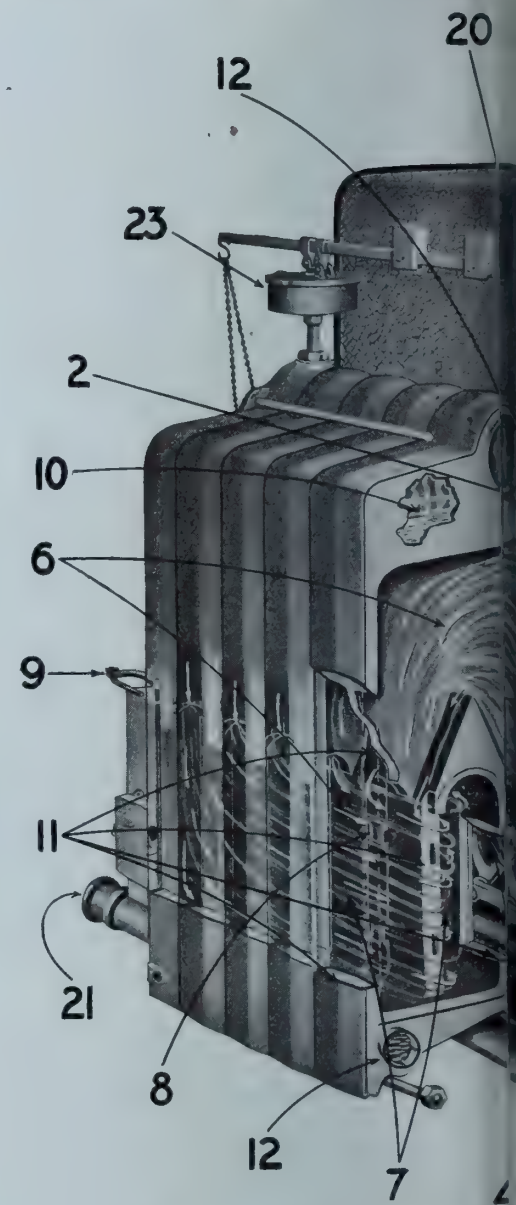
(5) *Air-Cooled Centre Grate Rest.* It is hollow. Open to air in front. Ends in draft inlet at rear. Eliminates warping of grate rest.

(6) *Scientifically Correct Heating Surfaces.* Maximum amount of heating surface is exposed to the direct action of the fire.

(7) *Unusual Heat Absorbing Flue Arrangement.* From the direct fire surfaces, the gases follow downward between the sections into the outside flue, then forward into the inside flue, from which they pass rearward to the smoke box, thus leaving the boiler at the coolest part.



Here is the full sized Newport Magazine Type of Boiler.

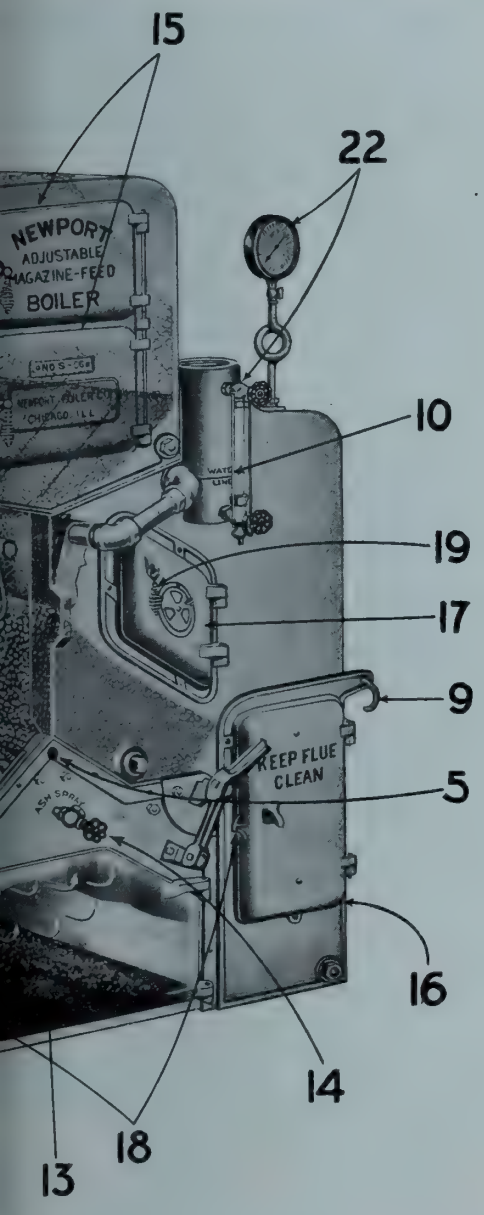


Lord & Burn

ROYAL BANK

Factory: St

to Get Straight
ine Feed Type of Boiler
& Burnham Co.)



(8) *Adjustable Flue Travel.* Is adjustable by the removal of one or more of the plates located in the flues between the sections. Gases are thus short-circuited into the smoke outlet.
(9) *Direct Draft Dampers.*
(10) *Low, Steady Water Line.* Water line the lowest of any boiler on the market.
(11) *Rapid Circulation in Waterways.* All waterways are thin, vertical and unobstructed. The supply outlets are located immediately above the *direct heating surfaces.*
(12) *Large Cast-Iron Push Nipples.*
(13) *Ash Pit.* It is from 50% to 200% larger than in most other boilers of the same rating.
(14) *Ash Spray.* By the turn of a valve, it sprinkles the ashes and eliminates dust annoyance from their removal.
(15) *Large Double Magazine Doors.* Doors arranged one above the other, permit the *complete* filling of the magazine.
(16) *Large, accessible flue doors.* Makes flue cleaning easy.
(17) *Self-closing Fire Doors.*
(18) *Reinforced Door Catches.* All door catches are heavily reinforced to prevent breakage.
(19) *Cool Handles on Fire Doors.* They are made of nickel.
(20) *Core Tie-Rod Openings.* The tie-rods pass through cored openings, in the sections, and not through the water.
(21) *Low Return Inlets.* Only 4½ inches above floor level.
(22) *Highest Quality Trimmings.* Every one notches up to the high standard of the Newport itself.
(23) *Effective Automatic Damper Regulators.* The different temperatures are obtained by simply changing the position of the weights on the arm.
This Newport Magazine Feed Type of Boiler is the Magazine Boiler for you to sell.
See about selling it.



Here is the Newport in a small size.

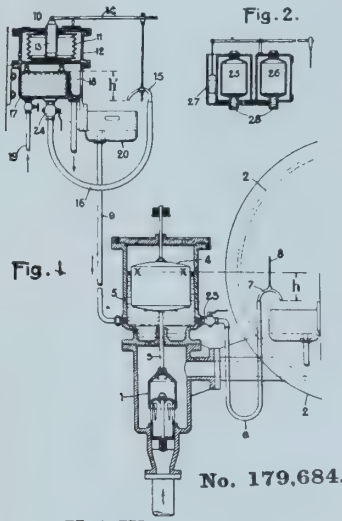
Co. Limited
Of Canada
G, TORONTO
s, Ontario.

New Canadian Patents

No. 179,684.

Wilhelm Zublin, Winberthur, Switzerland, 9th October, 1917; 6 years. Filed 21st July, 1917. Receipt No. 282,686.

Claim.—1. In a hot water heating installation, an apparatus for regulating the flow of circulating water, comprising a controlling valve for the flow of water, a movable float connected therewith, a float chamber containing the float and furnished with a liquid supply, flexible pipes arranged with regard to said float chamber so as to determine a regulable flow of liquid through the same, and automatic adjusting devices connected with said flexible pipes and arranged to raise or lower them in dependence of variable service conditions in order to correctly harmonize the liquid flow through liquid float



Hot Water Heater.

water, comprising a controlling valve for the flow of water, a movable float connected therewith, a float chamber containing the float and furnished with a liquid supply, a flexible pipe arranged with regard to said float chamber so as to determine a supply flow of liquid to the same, an automatic adjusting device arranged to operate on temperature variations and connected with said flexible pipe to raise or lower it according to temperature variations in view of regulating the liquid supply flow to the float chamber, a second flexible pipe connected to the latter for discharging liquid therefrom and coupled with the governor of the heat engine to be raised or lowered by the same in dependence of the engine load, substantially as and for the purpose described.

3. In a hot water heating installation, the combination of a heat engine and a waste heat recovering device for heating the circulating water, with an apparatus for regulating the flow of circulating water, comprising a controlling valve for the flow of water, a movable float connected therewith, a float chamber containing the float and furnished with a liquid supply, a liquid supplying vessel chamber according to variations on said conditions, substantially as and for the purpose described.

2. In a hot water heating installation, the combination of a heat engine and a wast heat recovering device for heating the circulation water, with an apparatus for regulating the flow of circulating with constant liquid supply, a flexible pipe connected to the said liquid supplying vessel, an intermediate vessel connected to the float chamber and arranged to be supplied from said flexible pipe, an automatic adjusting device arranged to operate on temperature variations and connected with said flexible pipe to raise or lower it according to temperature variations in view of regulating the liquid supply flow to the float chamber, a second flexible pipe connected to the latter for discharging liquid therefrom and coupled with the governor of the heat engine to be raised or lowered by the same in dependence of the engine load, substantially as and for the purpose described.

No. 179,510.

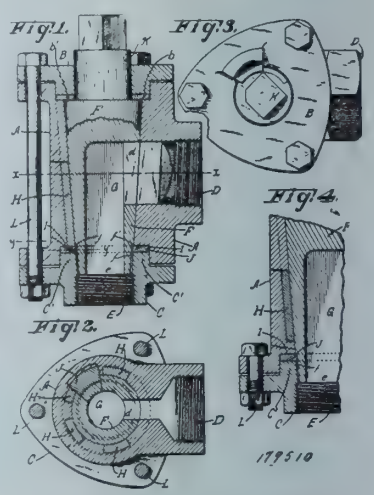
John N. Moehn, Oscar H. Etuewe and Frank Stock, co-inventors, all of Milwaukee, Wisconsin, U.S.A., 2nd October, 1917; 6 years. Filed 31st May, 1917. Receipt No. 280,429.

Claim.—1. The combination with a valve casing having a tapered bore extending therethrough and a side inlet port communicating with said bore, of a tapered plug valve seated in said bore and provided with a port adapted at one end for registry with the inlet port, and at the other end leading through the smaller end of the valve, the opposing surfaces of the valve and casing being annularly recessed at said end to provide a packing cavity open to the exterior at the end of the valve and casing, a cap covering said end of the casing and having an outlet port therein encircled by an annulus projecting into said cavity, and an apertured packing interposed between said annulus and the walls of the cavity with the smaller end of the valve projecting through it into the outlet port, substantially as described.

2. The combination with a tapered plug valve having an elbowed passage extending inwardly from one side of the valve and outwardly through the smaller end thereof, said end of the valve having its exterior wall recessed and adapted to co-operate with a casing to form a packing receiving cavity, a casing in which said valve is seated, provided with an inlet port with which the inlet end of the valve port may register and having an opening through which the smaller end of the valve projects, a cap having an outlet port adapted to receive the projecting end of the valve, and provided with an annulus extending into said cavity, and adapted to clamp a packing therein between the cap and casing wall, and means for adjustably securing said cap to the casing, substantially as described.

3. The combination with a valve casing, of a tapered plug valve seated therein, and having an elbowed port leading through one side and the smaller end of the valve, the opposing walls of said valve and casing being arranged to form an annular packing seated in said cavity, an adjustable annulus seated in said cavity and means connected with the casing, for clamping said packing against the casing wall of said cavity in frictional contact with the valve.

4. The combination with a valve casing having a tapered bore extending therethrough, a tapered plug valve seated therein, said casing having a lateral



No. 179,510. Plug Valve.

inlet port and said valve having a passage adapted at one end for registry with said port when the valve is in one position of rotative adjustment, said valve passage extending through the smaller end of the valve and said valve and casting being formed to provide open annular recesses at their respective ends to receive a packing, and a set of clamping caps adjustably secured to the casing and each adapted to compress the packing between it and the base of one of said recesses, portions of said valve extending through both of the packing receiving recesses, whereby said packings may be forced inwardly into frictional contact with the sides of said portions of the valve by compression exerted by the clamping caps.

5. The combination with a casing having a tapered bore extending therethrough, of a tapered plug valve adapted to fit said bore and having an elbowed port extending from one of its side walls through its smaller end.

Market Conditions and Tendencies

Statements Regarding the Prices and Trend of Supplies.

THE MARKETS AT A GLANCE

THE situation with respect to importation of steel sheets from the United States has cleared up somewhat since last issue. It is now apparent that the lighter gauges of sheets are to be allowed to come forward as they have in the past, the embargo applying only to No. 10 gauge and heavier. Confusion was caused in some quarters over the recent railway embargo in the United States which prevented the shipment into Canada of all goods in value $100 and over. This was only a temporary measure, however, to relieve congestion. The basis for the report that all steel sheets were again on the embargo list in all probability had its origin in this temporary railway embargo. It is understood that this embargo has now been raised.

The embargo on movement of goods has been raised by the three Canadian railways and goods held at border towns in transit from the United States are now being distributed more freely. With the opening of navigation conditions are expected to show rapid improvement.

Tin has featured the non-ferrous metals since last issue and further advances of 9c to 10c per pound are recorded. Licenses for export from Great Britain are now required which has firmed up the market materially. Future supplies are uncertain as the method of distribution has not yet been outlined.

Solder reflects the advance in tin, advances as high as 7c per pound having been recorded in some quarters. Closet bowls have made an advance in price of 75c each and two-section cement laundry tubs also take higher quotations. Business is seasonable which means rather tending to quietness in the majority of plumbing lines.

TORONTO, March 12.—Confusion which resulted over the recent railway embargo in the United States, which prevented the shipment into Canada of all goods in value $100 or over, has been overcome. This was only a temporary measure adopted to relieve congestion and has now been raised. Not much change has been evident in the market situation since the last report, and the general feeling is one of waiting and watching what developments the break to milder weather may bring. Business in some lines is reported fairly good, but plumbing lines generally show little activity. Predictions as to what may develop in the building trades are not being made very freely, as it is felt too much uncertainty prevails to gauge the situation efen reasonably well. Richelieu closet bowls and two-section cement laundry tubs record an advance in price over former quotations. The market generally is holding firm.

Shortage In Some Sizes Range Boilers

RANGE BOILERS.—A shortage in some of the larger sizes of range boilers is reported since the previous issue. Raw materials are becoming increasingly hard to secure, which has resulted in a limited output of some sizes. Lots of the 30-gallon size are available, however. The question in respect to shipments of the lighter gauges of sheet steel being required to come forward under license has been settled temporarily at least, and no change in former regulations has been made. Prices show no change over those recorded in last issue, which were as follows:

	Standard	Extra Heavy
30-gallon range boilers....	$14.00	$17.00
35-gallon	17.00	20.50
40-gallon	20.50	24.00
52-gallon	28.00	32.00
66-gallon	37.00	42.00
82-gallon	45.00	50.00
100-gallon	62.00	70.00

Closet Bowls Higher; Laundry Tubs, Too

ENAMELWARE.—An advance in the price of Richelieu closet bowls of 75c each has been made, and the new quotations for type with or without extension is now $6.25. Two-section cement laundry tubs also show an upward tendency, prices now prevailing on the following basis: With cement stand, $9; with iron stand, $9.25 each; without stand deduct 50c. The demand on all lines just now is by no means heavy and prices generally remain steady.

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Sinks, roll rim, 18 x 30 in., staple.....	16 80
Closets, oak tank and seat	22 00
Do., enamel iron or white vitro tank...	23 75

Soil Pipe And Fittings Show No Change

SOIL PIPE, FITTINGS.—No great activity in soil pipe and fittings is apparent at present. Prices show no change on the various commodities. Cast iron and malleable pipe fittings also remain steady, with the demand in some quarters reported good. Quotations prevailing to-day are as follows:

SOIL PIPE FITTINGS.

Medium and extra heavy soil pipe, 6-inch and under	35%	2½%
8-inch soil pipe	....	30%
Medium and extra heavy fittings, and under	40%	2½%

C. I. PIPE FITTINGS.

Cast iron fittings	....	15%
Cast elbows, tees, etc.	....	15%
Plugs	25%	
Bushings	30%	33%
Flange unions, standard	....	20%
Dart unions, ¼-inch to 2-inch.....	20%	25%
Do., 4½ in. and larger	....	15%
Nipples, up to 4-inch	....	45%
Do., 4½-inch and larger	....	40%
Do., running thread 4-in. and under	....	25%
Couplings, 4-in. and under	....	35%
Do., 4½ in. and larger	....	15%

MALLEABLE FITTINGS.

	Black	Galv.
Malleable Fittings, Class A, lb.....	0 50	0 63
Do., Class B, lb. net.....	0 22	0 33
Do., Class C, lb. net.....	0 15	0 22

Probability Of Waste Advancing Soon

WASTE, OAKUM.—A strong undertone to the waste market is reported and that an advance is almost sure to be made effective in the near future has been gathered. In some quarters, it is felt that present prices are too low. Stocks are reported to be in good shape and equal to heavy demands which may soon develop. At the present time shipments are limited. Prices on white wiping waste range from 16c to 21c per lb.; on colored wiping waste from 12c to 16½c per lb.

Oakum held steady and no change is anticipated at the present time. Prices are given herewith:

		Per 100 lbs.
Best American	....	$21.50
U.S. Navy unspun	....	20.75
Plumbers' spun	$8.50	10.00

Conditions Unchanged In Valve Situation

VALVES.—Business continues brisk in valves, with prices holding firmly at levels recorded in the last issue. A new heavy duty valve with a packing gland

is being placed on the market, the discount on which has been established at 15 per cent. Manufacturers are maintaining capacity output, and no cessation of orders is being looked for. Present quotations are:

	Discount off list
Ground work	50
Compression work, standard	52
High grade	45
Cushion work	46
Fuller work, standard	50
High grade	43
Basin cocks, No. 0 standard	46
Nos. 1 and 2	46
Bath cocks	53
Flatway stop and waste cocks, standard	53
High grade	50
Roundway stop and waste cocks, standard	53
High grade	50
Brass steam cocks, standard	Net
Globe, angle and check valves, standard	10
Do., removable seat	7½
Radiator valves, standard	15
Do., removable seat	10
Patent quick opening valves	35
Basin Cocks—	
No. 0 and 1, Fuller pattern	50
No. 0 and 1, compression	46
Midget	50
Globe, angle and check valves, medium pressure	30
Radiator valves, standard	30
Radiator valves, Jenkins disc	30
Radiator valves, quick opening	40

Some Sizes Of Wrought Iron Pipe Up

WROUGHT PIPE.—New net list prices have been issued on wrought iron pipe, which provides for higher prices on certain styles of pipe. Standard buttweld and standard lapweld pipe remain unchanged in price. Standard lapweld genuine wrought iron pipe S/C shows an advance on sizes 4½ in. to 8 in., both black and galvanided, while extra strong genuine wrought iron pipe P.E. shows an increase in sizes 4½ in. to 8 in. Prices on standard buttweld and standard lapweld are given herewith:

WROUGHT IRON PIPE

Effective Feb. 5, 1918.

Standard Buttweld—	Per 100 feet Black	Galvanized
⅛ in.	$ 6 00	$ 8 00
¼ in.	5 16	7 29
⅜ in.	5 16	7 29
½ in.	6 55	8 12
¾ in.	8 28	10 41
1 in.	12 24	15 39
1¼ in.	16 56	20 82
1½ in.	19 80	24 89
2 in.	26 64	33 49
2½ in.	42 71	53 53
3 in.	55 85	70 00
3½ in.	70 84	87 76
4 in.	83 93	104 10
Standard Lapweld—		
2 in.	29 60	36 08
2½ in.	44 46	54 70
3 in.	58 14	71 53
3½ in.	72 68	90 62
4 in.	86 11	107 37
4½ in.	97 79	122 56
5 in.	114 00	142 82
6 in.	147 80	185 28
7 in.	192 80	241 57
8 L in.	202 50	253 75
8 in.	233 30	292 32
9 in.	279 50	350 18
10 L in.	259 20	324 80
10 in.	333 70	418 18

Terms 2% 30 days, approved credit.
Prices—Ontario, Quebec and Maritime Provinces.

Boiler Tubes Getting Nearer

BOILER TUBES.—Shipments of boiler tubes are reported as rolling toward Canada and receipt of these will ease the situation considerably. Stocks are at present limited, but the approach of milder weather will relieve any anxiety, for the present at least, over any delays which may occur in getting shipments through. Prices held steady.

Toronto—	Per 100 feet Cold drawn	Lapweld
1 inch	$36 00	$ ....
1¼ inch	40 00	....
1½ inch	43 00	36 00
1¾ inch	43 00	36 00
2 inch	50 00	36 00
2¼ inch	53 00	38 50
2½ inch	55 00	42 00
3 inch	64 00	50 00
3¼ inch	....	58 00
3½ inch	77 00	60 00
4 inch	90 00	75 00

Galvanized And Black Sheet Tangle Unraveled

SHEETS, PLATES.—Slightly lower quotations on galvanized sheets have been made in some quarters, but the market generally is pretty firm.

Apparently there has been some misinterpretation of the recent railway embargo on goods coming from the United States in value of $100 or more. This was evidently the foundation for the report that all gauges of sheets had been placed on the embargo list. That was in effect true, for it applied to all commodities and embraced steel sheets as well as other manufactured products. This measure was only a temporary one to relieve the freight situation, and has now been raised. This means black sheets will again be in the same position as formerly, namely, embargo only on No. 10 gauge and heavier.

Nothing new has developed in relation to the steel sheet situation, although shipments are reported to be coming along a little better. Stocks of both galvanized and black sheets are in very fair condition, although inquiries have been made for 10 gauge black sheets and 3/16 and ¼-inch plates, which are extremely scarce and hard to get. Supplies will be limited until decided improvement is effected in freight service and mills are operating at capacity output once more. This happy condition will not exist for several weeks yet, it is thought. Prices show the following range:

	Per 100 lbs.		
BLACK SHEETS			
10 gauge	$	$10 00	....
12 gauge	7 55	10 10	....
14 gauge	7 45	8 40	....
16 gauge	7 30	8 50	....
18-20 gauge	7 30	8 05	....
22-24 gauge	7 35	8 10	....
26 gauge	7 40	8 15	....
28 gauge	7 50	8 25	....
3-16-inch plate	10 25	....	....
¼-inch boiler plate	10 00	....	....
GALVANIZED SHEETS—			
10¾ oz.	$ 9 25	$9 50	$10 50
U.S. 28	8 95	9 20	10 20
U.S. 26	8 65	8 90	9 90
22 and 24	8 50	8 75	9 75
18 and 20	8 35	8 60	9 60
16	8 20	8 45	9 45
14	8 10	8 35	9 35

Solder Climbs Still Higher

LEAD AND ZINC PRODUCTS.—Added strength in the tin and pig lead markets resulted in a further advance in solder, some prices being made showing a 7c advance over quotations made last issue. The spread is somewhat greater, too, than prevailing formerly. Guaranteed now ranges from 48¾c to 53c per opund; strictly, 44¾c to 48c; commercial, 40¼c to 47c; wiping, 38¾c to 43¼c; wire, 48½c to 56½c; tinker's up to 53c. No change has yet been made in lead pipe or traps and bends, though the market is very firm. Zinc sheets remain stationary at 26c per pound. Business is reported excellent, shipments going forward freely.

LEAD AND ZINC PRODUCTS.—

Lead pipe, lb.	$ 0 14	$ ....
Lead waste pipe, lb.	0 15	....
Lead traps and bends	Net list	
Lead wool, lb.	0 16	
Lead sheets, 3 to 3½ lbs. sq. ft., lb.	0 13¼	
Lead sheets, 4 to 8 lbs. sq. ft.	0 12½	
Cut sheets, ¾c lb. extra, and cut sheets to size, 1c lb. extra.		
Solder, guaranteed, lb.	0 48¾	0 53
Solder, strictly, lb.	0 44¾	0 48
Solder, commercial, lb.	0 40¼	0 47
Solder, wiping, lb.	0 38¾	0 43¼
Solder, wire, lb.	0 48½	0 56½
Zinc sheets, per lb.	0 26	....

More Interest Manifest In Old Materials

OLD MATERIALS.—A slight improvement is manifest and more action has become evident. The demand is better and interest seems to have been revived materially. A very strong undertone to the market is evident and some advances in price may go into effect. The latest action of the Dominion Government in prohibiting export of all old material will have a firming tendency on the market. This move was taken, it is said, to assure Canadian manufacturers all available supplies. Prices are firm on the following basis:

Tea lead	$ 0 04½	....
Heavy lead pipe	0 07	0 07½
Yellow brass	0 12	0 13
Red brass	....	0 21
Light brass	....	0 09½
Heavy zinc	0 06	0 06½
Heavy copper	0 22	0 22½
Stove plate, per ton	17 00	18 00
Old cast iron, per ton	25 00	26 00

Ingot Tin, Pig Lead Move Upward

INGOT METALS.—The metal market has been featured since the last issue by further strength in tin, higher prices having been established in this commodity. Pig lead also advanced in some quarters, though the range of prices is somewhat wider than that prevailing previously. The commercial demand on practically all metals is greatly restricted just now, though the war demands are large and often result in creating shortage for commercial uses.

COPPER.—No excitement was evident in copper, which remains steady owing to the fixed prices established by the United States Government. Locally quotations range from 30c to 32c per pound. Exports during January, combined with Government orders, amounted to about 170,000,000 pounds, which left but 16,000,000 for ordinary commercial use, so some idea as to how the production is being distributed may be gathered.

TIN.—Quotations on tin are higher this week on the basis of from 95c to $1 per pound. Licenses for export from Great Britain are now required, which has strengthened the market. How

(Continued on page 28.)



TOWNSHIP CONTROL OF SEWAGE SYSTEM

York Township, Ont.—Town Council has been asked by a deputation of residents of Runnymede Road district, to take over the management of the water and sewage systems in the district and to improve on present arrangements, if possible. A petition for a sewer to be installed on Sibley Ave. was presented and referred to the township engineer for an estimate of cost.

CUT WAGES FOR SPECIAL WORK

Halifax, N. S.—Owing to the inability of the Relief Commission to obtain the services of plumbers for work beyond their eight hour day without paying a 50 per cent. advance on week days and a hundred per cent. advance on Sundays, an agreement has been effected under which the Plumbers' Union of Halifax will allow its members to work without these advances in cases of emergency for the Relief Commission.

IMPROVE FILTRATION PLANT

Chatham, Ont.—Faced with the problem of keeping the water supply intact during the spring freshets, the Chatham Water Commission has decided to make additions to the filtration plant at an estimated cost of $4,000. During the spring floods the present filters are unable to purify the supply sufficiently with the result that much sediment from the bed of the river is forced through the water system.

INCREASE WATER SUPPLY

City Engineer Mercier, of Montreal, has urged the Board of Control to make an immediate start on plans for increasing the water supply. The capacity of the existing single conduit is about 75,000,000 gallons daily. On two occasions this year the consumption amounted to 70,000,000 gallons, and the average daily last month amounted to 66,400,000 gallons. The consumption is increasing at the rate of about 10,000,000 gallons per annum. Another conduit, costing upwards of a million dollars, will have to be built, the aqueduct partially finished, or some other means found of increasing the water supply, it is stated.

CONTRACTS AWARDED

Hamilton, Ont.—J. H. Stewart & Son, Jackson & Hughson Streets, have plumbing and heating contract in connection with erection of store for the Southam Press Ltd., Toronto.

Three Rivers, Que.—Robert Dugre & Arsenault, Hochelaga Bank Building, have contract for reservoir in connection with construction of pumping station and reservoir costing $12,000 for city council.

WORKS CONTEMPLATED

Wasterworks and Sewage Disposal

Toronto—Board of control contemplate purchase of water meters costing $50,000.

Hull, Que.—City council contemplates construction of sewers, etc., costing $8,000.

Armagh, Qne.—Town council has authorized expenditure of $40,000 on waterworks, etc.

Elma Township, Ont.—Township council contemplates construction of 14-in. drain costing $3,000.

St. John's, Que.—Town council contemplates construction of $35,000 sewer system and catch basin.

Kincardine, Ont.—Town council contemplate purchase of sewage tank and repairs to Queen Street bridge.

Elma Township, Ont.—Three culverts for drainage will be constructed at a cost of $7,000 for the township council.

Chatham, Ont.—Civic Water Commission has decided to make additions to the filtration plant at an estimated cost of $4,000.

Cardston, Alta.—City has engineers engaged on the preliminary work for the installation of a new sewage disposal plant.

Hamilton, Ont.—City engineer recommends the installation of a complete storm-sewer system for the Kenilworth-Campbell Avenue section.

Kitchener, Ont.—City council is contemplating improvements to the water main system and securing a water supply from Bridgeport to cost over $100,000.

Ladner, B.C.—An extensive drainage scheme that will effectively take care of the whole western section of Delta municipality and costing in the neighborhood of $20,000 is being planned.

Calgary, Alta.—City is considering the installation of a new sewage disposal system. Work on the re-lining of the old sedimentation reservoir and installing a new one is now under way. Cost, about $190,000.

NEW PLUMBING BOOK

There are books and books published these days, some are worthy of merit, some are not. This applies particularly to books that are published which deal with trade and technical problems.

When an average professor writes, he generally writes to those who can read between the lines many of the things he himself is thinking about. This often misleads the ordinary tradesman, not intentionally by any means, but rather because the average mechanic in almost every trade has not had more than a public school education.

One of the latest books, "Elements of Plumbing" by Samuel E. Dibble, is not too highly technical, and should be on the bookshelf of every beginner, and, is well worth the price to every member in the sanitary engineering business.

Simply and understandably written and free from confusing formulas, it contains 18 chapters, over 160 pages and is highly illustrated.

Full particulars as to price etc., may be procured by dropping a post card to the book department, Maclean Publishing Co., 143 University Avenue, Toronto.

THE MODERN BATH-TUB

Probably the fact that plumbing troubles have occupied a good deal of attention this winter accounts for the reminiscences in United States papers of the installation of the first bath-tub in the White House. Last December was the sixty-seventh anniversary of the erection of this landmark in the social history of the Republic. When he took up his residence at the White House in 1860 President Fillmore insisted on having a bathroom with all the up-to-date appliances, and was furiously assailed by the provincial and rural press for his luxurious habits, and this departure from the democratic simplicity of his predecessors in office. It may be imagined that the cross-roads orators of the opposite party found the theme a sweet morsel for their tongues, and made the rafters ring with denunciation of this sybaritic innovation in an age when the bath was a weekly family rite, performed in the wooden tub in the kitchen on Saturday nights. The President's bathroom became a symbol of the enervating influence of European customs on a simple, pastoral people. He had disregarded the warnings of history. Had not the Romans begun to lose their



From left to right: Geo. Cooper, Geo. Clapperton and H. Hicks. All hard workers for the Toronto Society of D. S. & H. Engineers.

hardihood as soon as they gave up their cold dip in the Tiber and built stationary baths with hot-water attachments? The shades of Jackson and Jefferson must have been invoked against the corrupting example of a degenerate successor, who was poisoning the very fountain-head of national life.

The President's shame was the greater because he had been born poor in the backwoods, and in his boyhood had only primitive facilities for his ablutions. Perhaps his memory of youthful scourings, during which his comfort in cold weather depended on the kitchen stove, disposed him in after life more keenly to relish all the modern improvements. That cleanliness is next to godliness is a maxim of the English-speaking race, but the President's fellow-countrymen rebuked him because he chose to turn his ablutionary duties into a pleasure. Fillmore failed to get a renomination for the Presidency; perhaps his bathtub was thrown into the scales against him. If so he had the posthumous reward of the pioneer. His country pays him homage by making the bathroom the pivot of its domestic architecture. As travellers can testify, North America is the most bath-roomed portion of the earth's surface, though England holds her pre-eminence as the exemplar of the "morning tub," which is the amazement of the rest of Europe. As the Bulgarian patrician says in one of Shaw's plays:

> "I don't believe in going too far with these modern customs. All this washing can't be good for the health; it's not natural. There was an Englishman at Philippopolis who used to wet himself all over every morning when he got up. Disgusting! It all comes from the English: their climate makes them so dirty that they have to be perpetually washing themselves. Look at my father, he never had a bath in his life; and he lived to be ninety-eight, the healthiest man in Bulgaria. I don't mind a good wash once a week to keep up my position; but once a day is carrying the thing to a ridiculous extreme."

Which merely shows that some races are born with a fondness for water, some acquire it, and others refuse to have water thrust upon them.—Toronto *Globe.*

OVERHEAD EXPENSES AND PROFITS

(Continued from page 16.)

ranks of the profit getters, and that more will interest themselves in the tables and figures shown and compare them with those used in their own business. Then, maybe, they will come out of the wilderness they are now lost in.

In arriving at any percentage of profit we desire we should always bear in mind that this profit is forthcoming on your sale price, and not as a great number will persist in adhering to in practice by adding the desired percentage of profit to their prime or invoice cost, while others again add to their totalled prime cost and overhead charge. Needless to say both these latter are short changing themselves and sooner or later must admit a shortage in the expected profits they hoped to have, when they took stock of assets on hand. The first one is necessarily much quicker than the second one.

Bear in mind then that to your invoice cost, when you add the total of your desired percentage of profit plus your percentage of overhead expense on the gross amount of business done during the year, you are not securing your profit on sale price. To impress this fact more forcibly on your mind, note the accompanying table of percentages of cost which must be added to effect a given percentage on sale.

For instance we know that when 20 per cent. is allowed as an additional trade discount on heating goods, this is in reality 25 per cent. on the invoiced cost of these goods. So as you add on to a lesser amount a larger percentage, you must necessarily deduct a smaller percentage from the large figure to bring you back to the place you started from.

Remember that there is percentage and also discount and it is a very simple thing to get confused in handling the two. While in discount you necessarily use percentage, keep in mind that discount is not percentage.

$100.00 at 50 per cent, off gives us $50.00.

$50.00 at 50 per cent. on gives us $75.00.

It takes 100 per cent. on to bring the $50.00 back to the original $100.00. although it takes only 50 per cent. off to reduce the original $100.00 to $50.00.

I must stop before I befuddle you with all these contrary suggestions. But can I feel that in my past efforts I have made these problems more simple to be understood by all of us, and acted upon? In the first place we dwelt upon overhead expenses, and if my words have caused some thought, then headway is being made. Then it is most necessary for you to become acquainted with the question of profit and its close relation to percentage of the whole and to understand this most thoroughly, so that facts will be your ground-work instead of the guess-work that has always prevailed among those in our Craft.

Always keep in mind that your selling price must represent 100 per cent. To find your selling price that will assure your a profit on your gress cost, and overhead expenses, multiply the amount of the gross or original cost by 100 and divide the result by the percentage that cost represents of the total 100 per cent.

Try it out in the meantime and in my next talk I will illustrate it by a table, accompanied by examples to show that the above is correct.

CORRECTION
Practical Sheet Metal Work

The following reading matter belongs to sheet metal article number 27 and was unfortunately omitted from last issue. The article was, therefore, incomplete.

the eavetrough happens to be one of the same style as shown, viz., a true half circle, the portion marked Fig. B will be pattern.

Before concluding this answer to inquirer let us here mention that in a shop where a large amount of eavetrough work is done, a great deal of scrap may be used up in making these mitres, and the work is interesting to the apprentices.

It is of course well known that these mitres can be bought very cheap, but we must consider that the time on such jobs is well spent, and to the lad in the shop learning his trade, the employer has a duty to perform. He will reap a greater benefit in the end than the actual cash value saved in buying these ready made.

SHOULD PAY ONLY FOR HEAT VALUE IN COAL

It is estimated that the Dominion Government burns over $1,000.000 worth of coal yearly, and yet scarcely any of this vast quantity is purchased under rigid, detailed specifications. Private corporations as well as governments in Canada buy coal mainly on its reputation or trade name, rather than under contracts specifying the heating value of the coal, its ash and moisture contents and other characteristics. To get proper value for his money, the consumer must know the heating value of the fuel he purchases.

The United States Government spends $8.000,000 annually on coal, all of which, since 1906, has been bought on rigid specifications and subjected to chemical analyses and heating tests. If coal not up to contract is delivered by a contractor, he is paid less than the standard price for it.



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

DO YOU RECOMMEND THE USE OF A TRAP BETWEEN THE TANK AND THE STACK?

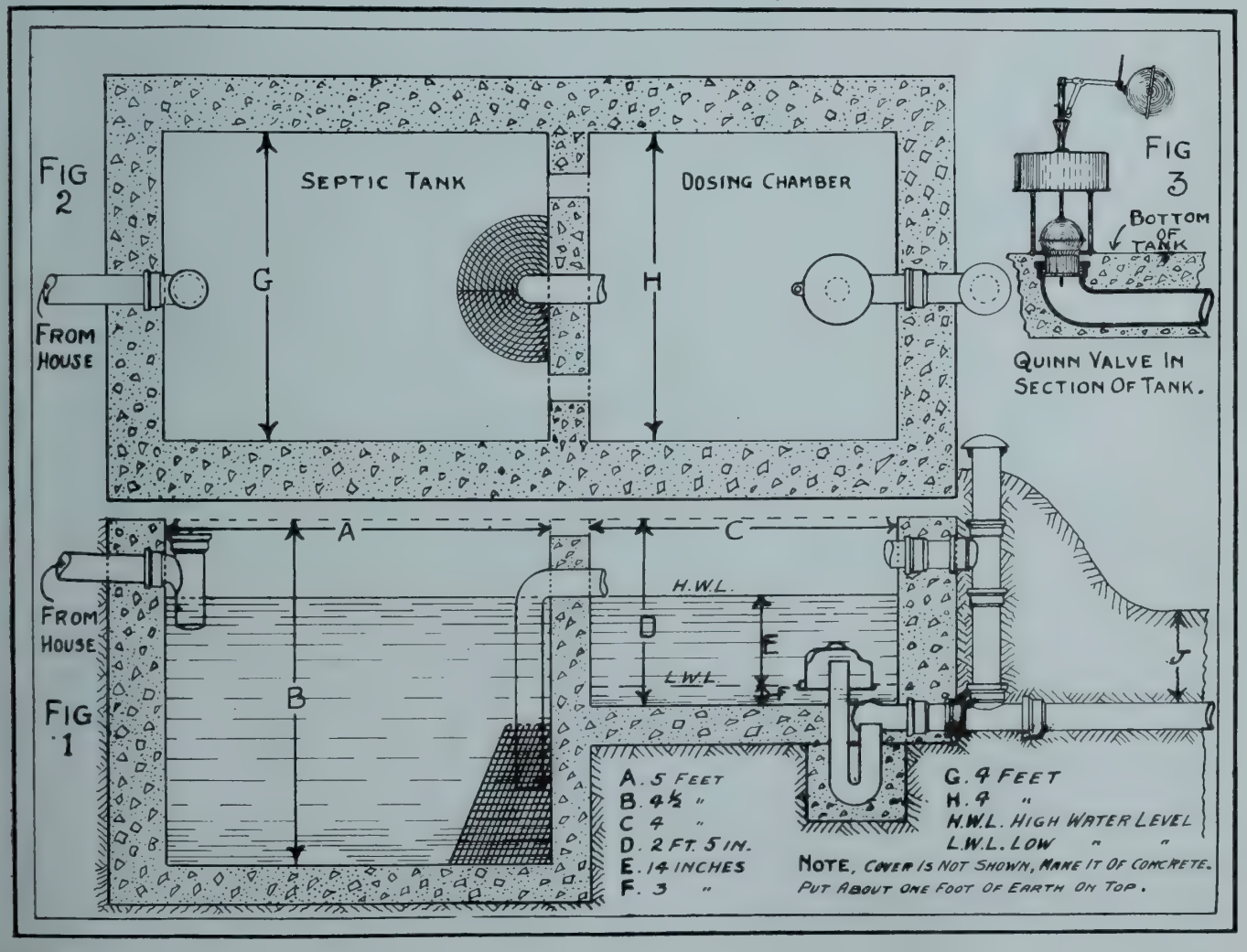
Editor of SANITARY ENGINEER,—In your issue of September 15 you published an article dealing with sewage systems for country homes, and showed a drawing of a septic tank. There are one or two points on which I am not quite clear, and I would appreciate it very much if you would deal with these questions which are as follows:

1. Do you recommend the use of a cast iron or tile trap between the septic tank and the house drain or sewer?

2. If a trap is not used what is there to prevent the air from circulating through the vent pipe and the opposite end of the dosing chamber over the partition between the two tanks and drawn up the main stack through the roof? The main stack being the highest would naturally draw air through the vent.

3. I have always understood that the anaerobic bacteria which are cultivated in the septic tank, which is the compartment which receives the raw sewage from the house, do not require air, in fact do not germainate when supplied with fresh air. If this is the case would not the fresh air just passing over this tank be harmful to these bacteria?

4. I have seen drawings of septic tanks with a tight wall between the septic tank and the dosing chamber. What is your view in regard to this, or what is the



benefit of allowing the air space between the two tanks as shown in your drawing which appeared in the September 15 issue of SANITARY ENGINEER?

L. A. W. Manitoba.

Replying to the first question as to whether a trap should be used between the main house stack and the septic tank we would state that the trap should not be used on any account. The reason for this is better explained by answering question No. 2. Our reader asks if the air which will circulate through the vent pipe is not harmful to the bacteria that are germinating in the septic tank.

We would ask our readers to remember that a septic tank is not necessarily always one with two divisions. For example it might be necessary to install a septic tank with just one compartment to merely receive the raw sewage, and in that case the dosing chamber would require to be a separate tank. But the drawing referred to which apeared in the September 15th issue shows a two partition tank, one division or compartment is used as the septic tank and the other the dosing chamber which is shown in Fig. 2. We are reproducing this cut for the benefit of our readers so that they will be able to refer to it with this problem under discussion.

When it is stated that the anaerobic bacteria in the septic tank do not require air it certainly must not be taken for granted that these germs are receiving any air, because, in the process of germinating they are throwing off carbonic acid gas, and a scum is formed on the top of the sewage. This scum prevents any air from getting to the raw sewage underneath. It will be seen that the raw sewage is discharged underneath the scum by having the T. Y. submerged below the high level in this septic tank.

Now, if the air were not allowed to circulate, a large quantity of carbonic acid gas would collect in this septic tank and the very fact that this type of bacteria throws off carbonic gas would at once convince the reader that these bacteria do not require carbonic acid gas, if they did they would not throw off this carbonic acid gas, and, as we said before, if there were no ventilation pipe or if there were a trap between the main house stack and the septic tank then the carbonic acid gas would not have any means of escape unless it passed back through the vent pipe, and it is not advisable that carbonic acid gas should be discharged through this vent pipe because it would be too near the breathing area of occupants of the home or the surroundings.

Our enquirer states that he has seen a septic tank built with tight walls between the septic tank and the dosing chamber. Such a type of tank is not by any means at all practical and should not be allowed. We can assure our readers that the drawing shown herewith is one of the best and most up-to-date designs of tanks that could be desired, and has proved to be very efficient no matter in what climate.

In replying to question three we might refer our readers to the reply to question two, which is almost identical, although worded in a little different manner. We want to impress our readers most forcibly that the reason why the scum on the top of the sewage on the septic tank should not be disturbed is so that it will be a protection for the anaerobic bacteria underneath from being in close contact with fresh air.

If our readers would like to do a little experimenting and prove for themselves what really takes place in a septic tank, the following experiment would be very interesting:

Get about half an ounce of Fleischman's yeast, allow it to be fairly well dried and crumble it up. Then add some water with a temperature of about 65 degrees, not more, and not less than 60 degrees, and mix this half ounce of yeast in a half pint glass, then let the contents stand in the glass and watch carefully what takes place. In about 15 or 20 minutes it will be found that the small particles of yeast will begin to rise and fall in the liquid and the yeast will almost form a froth or thick scum on the top.

If this liquid is allowed to stand say for about four hours and not allowed to get any cooler than about 65, there will be found on top at least one quarter of an inch of frothy substance or yeast, very much like the yeast that would be got from a brewery.

If a small cone-shaped bag were made with a small hole in the top about the size of a pin head, a match struck, and the paper bag lifted from the top of the glass and the match put in, it would be found to go out instantly. This is due to the contents of the bag containing carbonic acid gas.

This carbonic acid gas as we stated before is injurious and should not be inhaled. Therefore it is much better to have the air passing through the vent pipe and across the top of the two tanks and up through the stack than to have the carbonic gas discharging in the opposite direction and through the vent pipe near the ground.

HEATING SYSTEMS BURST

It is estimated that over 100 hot water furnaces have burst in Toronto and the suburbs during the last sixty days as a result of the freezing of expansion tanks, and scores of radiators have frozen on account of the occupants of the homes shutting off certain sections and closing the rooms in an endeavor to save fuel. Then when the damage has been done, the fault has been laid at the doorway of the steamfitter, or else the furnace.

The warm air furnace man also comes along with his "hot air" insinuations that "If you had put in one of our hot air furnaces you would not have had this trouble," referring of course to the frozen "rads" or burst sections, etc.

All such troubles would be for ever overcome is we had all heating systems under the jurisdiction of the board of health. We do not want a heating by-law that is only going to govern one type of system. Heating and ventilation is a health matter and should be under the board of health.

Further a heating ordinance is more than a mere local matter. It is a federal problem, because, as a matter of fact, in Canada we have to transport most all of our coal, and transportation is a matter which should be governed by the federal government. It is a national problem is this fuel conservation and if all heating installations whether for power purposes or for heating our buildings were under the mechanical department of our health boards we would be able to save approximately 8,500,000 tons of coal every year.

The bursting of a furnace casts no reflection upon the furnace. There is a remedy, but price has predominated at the expense of efficiency.

The writer lived in a certain house for five years, the first three years a popular warm air furnace was in use, for those three years 8 tons of coal every Winter was consumed, and not one pound wasted where it could be prevented. The warm air furnace was taken out and a small vapor steam heating system was installed, the result was that the fuel consumption dropped down to 5 tons for the Winter season.

There is no bigger fuel waster in existence to-day than the average warm air furnace, and this is not by any means the fault of the furnace. It is more often than not the way it is installed.

MARKET CONDITIONS AND TENDENCIES

(Continued from page 24.)

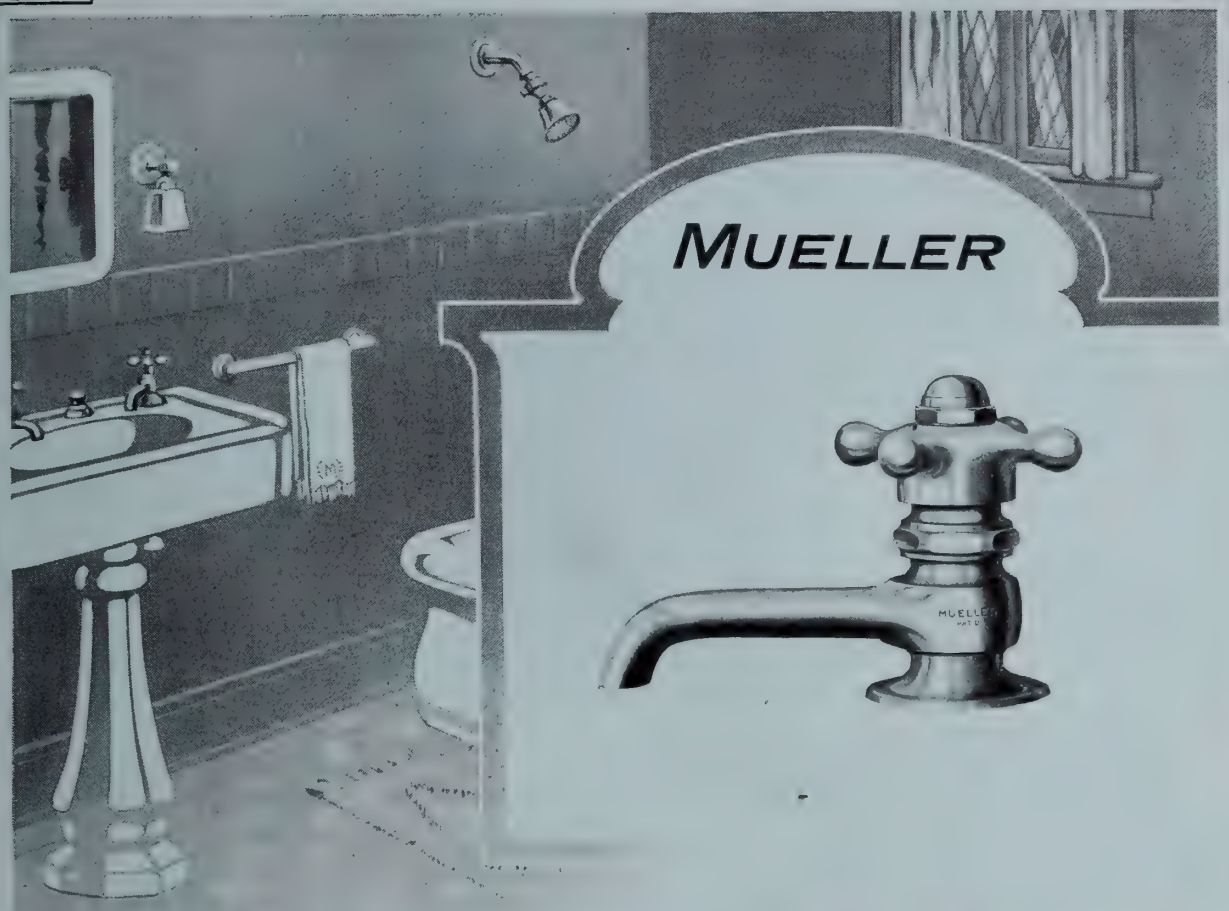
orders will be distributed is as yet uncertain, and so no forecast can be made as regard future supplies. A good demand for Banka and Chinese tin has become evident in New York. With decreased shipment from London, trade is switching to the Pacific, where it is thought a proportionate increase in Chinese trade may be expected. The primary markets are strong and active.

SPELTER.—A moderate demand prevails on spelter, with prices unchanged at 9¾c to 10½c per pound. No change is anticipated in local quotations, though slight vitality in the primary markets has been evident and resulted in slightly higher prices.

LEAD.—Pig lead shows an upward tendency. The range of prices now runs from 9¼c to 10c per pound. Little lead is available for immediate distribution in the primary markets and with uncertainty as to shipments a stronger tone has developed. The demand locally is light.

ANTIMONY.—Quiet prevails in the local market and quotations are unchanged at 16c to 18c per pound. The primary markets continue quiet and no change in the prices prevailing has been made over those shown in last issue.

ALUMINUM.—A very firm tone to the market is evident, though no changes in prices have been put into effect. The basis of 60c per pound locally was maintained. A fair inquiry is reported in the primary market, with prices holding steady.



Self-Closing Basin Cocks

WHEN you complete the installation of **MUELLER** Self-Closing Basin Cocks you know you have given your customer the maximum of service.

A phosphor bronze spring of permanent elasticity is the actuating factor, and requires but little more effort to operate than the ordinary compression cocks. The tension of the spring will close against 175 lbs. of water pressure, and the **MUELLER** patented roller bearing eliminates friction and assures operating satisfaction and lifetime wear.

A malleable iron-locking washer is furnished with **MUELLER** Basin Cocks. It locks the Cocks immovably to basins of any thickness at any angle desired.

The **MUELLER** formula of red brass and careful attention to coring, machining and finishing guarantees the superiority of **MUELLER** quality.

H. Mueller Mfg. Co., Limited

SARNIA, CANADA

MUELLER

PRACTICAL SHEET METAL WORK

(Continued from page 15.)

ved lines as shown which will complete the oblong piece.

Follow out the same instructions when developing pattern for large end. The only difference being that each section is equal of which there are only eight in the large round end, whereas in the case of the oblong piece there are twelve sections, viz., eight to complete each semi-circle of the oblong and four to form the flat portion.

The next step will now be the developing of the pattern for the centre piece in Fig. 1, as shown at x, a, b, c, d, e, x, and 1, 2, 3, 4, 5 and erect a number of triangular lines by connecting to 4, 4 to d, d to 3, 3 to c, c to 2, 2 to b and b to 1.

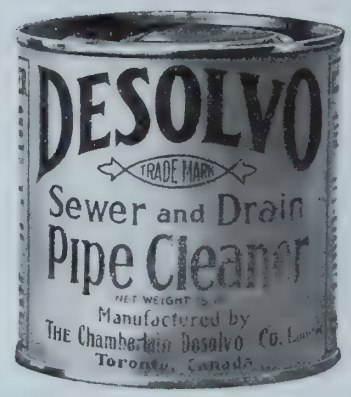
Now turn to Fig. 4. Erect a vertical line as shown at x 5 and transfer the triangular measurements as shown by opening up compass placing point at 5, in Fig. 1 to point x e, this indicates that the same measurement must be repeated to form the oblong portion on pattern. Next transfer measurements in turn from e, 4, Fig. 1 to e, 4, Fig. 3, intersecting the letters a, b, c, d, e, by the corresponding measurements in the semi-circles on the plans as well as intersecting the figures 1, 2, 3, 4, 5. It will be noted that each triangle with its respective letters and figures is the same measurement as in Fig. 1.

(Continued in Next Issue.)

TRY A CAN AT OUR EXPENSE

It is not often that you are asked to TRY BEFORE YOU BUY, but we know from experience that DESOLVO will do all we claim it will do, so we ask you to TRY BEFORE YOU BUY, so it's up to you.

DESOLVO has been in use in the United States for over 10 years and in Canada it is being endorsed by every one who has used it. It will clear blocked-up waste and soil pipes and will not injure the pipes or fittings.

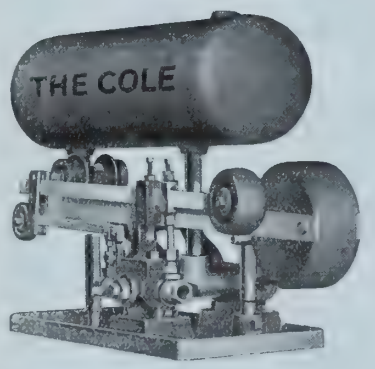


The only pipe solvent that can be used with cold water. It generates its own heat.

Drop a line on your letterhead, naming your jobber, and we will send you a trial can absolutely FREE.

Chamberlain Desolvo Co., Limited, Toronto

STEVENSON BUILDING, CHURCH ST., TORONTO. General Offices, Pittsburgh, Pa.



The Cole Trap for Handling Condensation



You have seen this before.

Do you know what it is?

If you do, you've made some money installing it.

For the past year by our records steamfitters' profits on this line equals $10,000.00, and only a few divided it between them. Get after your share.

Write us. Watch our advts.

GEO. W. COLE, LIMITED

New Address: 2002 Dundas St. W.

Old Address: 838 Dundas St.

TORONTO



The best advertising you can get is to satisfy your customers and the most exacting customer will be thoroughly pleased with the quiet operation of the

TRADE SILENTFILL MARK

NO NOISE.

MANUFACTURED BY

CALLOW & PHILLIPS

40-42 Lombard St., Toronto, Can.

Telephone Main 2016

PURO

MEANS

EFFICIENCY

CONSERVE LABOR

By preventing contamination in drinking water. PURO will do this and also save time and water. Can you afford to be without this investment?



Ask us about you problems.

Our Sanitary Engineers are at Your Service.

THE BEST IS THE CHEAPEST

Puro Sanitary Drinking Fountain Co.

147 University Ave., Toronto, Canada

FOR SALE—PLUMBING AND TINSMITHING, good business, live city; snap for some one. Box 342, Sanitary Engineer, Toronto.

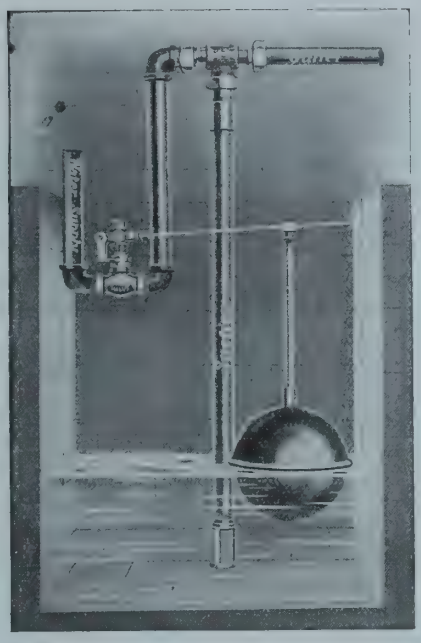
THE "MORRISON"

Automatic Cellar Drainer

For ease of operation and simplicity of construction, this cellar drainer has no equal. It can be installed easily, and takes up very little space. No complicated cams or levers to get out of order. And all working parts are placed above water.

This is a very important feature in cellar drainers, because when such an appliance is submerged, it is liable to get dirt into the moving parts.

No such trouble for you if you instal a "Morrison."



No part of a sanitary system can cause so much damage as can a poorly constructed cellar drainer. The whole contents of a basement is liable to damage.

Building foundations are protected and all other assets below the ground floor when a Morrison cellar drainer is installed. We have been established over 50 years, and all our experience stands behind the "Morrison." Let us furnish you with full particulars and prices before you decide to buy your next lot of cellar drainers.

James Morrison Brass Mfg. Co., Ltd.

93-97 ADELAIDE STREET WEST, TORONTO

HOYT METAL GOODS ARE KNOWN

FROM COAST TO COAST



As time-savers there are none equal to our Wiping Solder, Bar or Wire Solder.

Hoyt Lead Traps, bends and waste pipe are in a class by themselves.

All our products are made to formula.



Our Mixed Metal Sales Amount To Over $5,000,000 Annually.

Write your Jobber

HOYT METAL COMPANY, TORONTO, ONTARIO

New York, N. Y., London, Eng., St. Louis, Mo.

Write Us

WE SPECIALIZE

In the Manufacture of

CAST IRON SOIL PIPE and FITTINGS

as well as

GALVANIZED RANGE BOILERS AND EXPANSION TANKS FOR HEATING SYSTEMS

TORONTO HARDWARE MFG. CO., LIMITED

"We Are Oversold"

ONCE upon a time a certain manufacturer was urged by his retailers to cut out his advertising in consumer mediums because it was embarrassing them. This manufacturer was disposed to listen to his retailers because his product was heavily oversold. He half-welcomed the chance to save the money he was spending on consumer advertising in national mediums.

So he cut out his consumer advertising.

Then arose a competitor—a new man in the field. He went to the retail trade and got orders easily, for he was in a position to make immediate deliveries. He made a good article, and it was a "cinch" to open up connections with the retail trade. He got in strong and permanently, and to-day he is a formidable rival to the manufacturer who ceased his selling propaganda.

That oversold manufacturer admits that he has had a lesson for life. If retailers were to say to him to-day —"Please cut out your consumer advertising. You can't meet the demand you have created and the public's insistence for your article is causing us to lose sales"—if retailers said this, and they have said it, this manufacturer has his reply all ready. It is— "Never again! I stopped once, and I opened the door to a new maker. It has cost me many times what I thought I was saving to hold my own and to recover what I lost. I learned something three years ago when I yielded to the temptation to cut out my consumer advertising, and in future I'll keep on advertising to the public even though I may find myself heavily oversold."

To-day hundreds of manufacturers are oversold. Some have cut out their consumer advertising. Some have kept up their publicity campaign with little or no diminishment. These consistent and persistent advertisers are not regretting their policy. Some of the others are, and they admit freely their error. They are finding that the lost momentum and the new competition which has arisen will require a doubling and tripling of future advertising and selling effort to get back to old positions.

When war contracts were easy to get and looked plums, many manufacturers dropped making their usual line and went in for the fortunes which they thought could be made in a few months. If you ask some of these manufacturers to-day what they think of their cessation of making their usual line for which a big consumer demand had been created at great cost by national advertising, and which retailers were glad to distribute, because selling it was easy, you will be told by those frank enough to make honest confessions, "We made a mistake. We are finding it harder now to get back to our old place with the retailers and the public. We have lost ground. We regret the mistake we made. It will cost us much money to get back again, and in the meantime retailers and the public have learned to buy others' merchandise."

IF the firms who are oversold, and the firms who have lost something of value because of the stoppage of their advertising, find in the foregoing any message to them, let us say to them that they can do influential advertising of a national sort, effective on both consumers and distributors, by the use of two national mediums—MACLEAN'S MAGAZINE and FARMERS' MAGAZINE. The cost of strong campaigns in each of these magazines, and in them both, is as follows:—

	Circulation	Number of of issues per year	Minimum page rate	Cost of page in every issue
MACLEAN'S MAGAZINE ..	55,000	12	$147.00	$1,764.00
FARMERS' MAGAZINE	30,000	24	75.60	1,814.40
Both Magazines	85,000	36	$222.60	$3,578.40

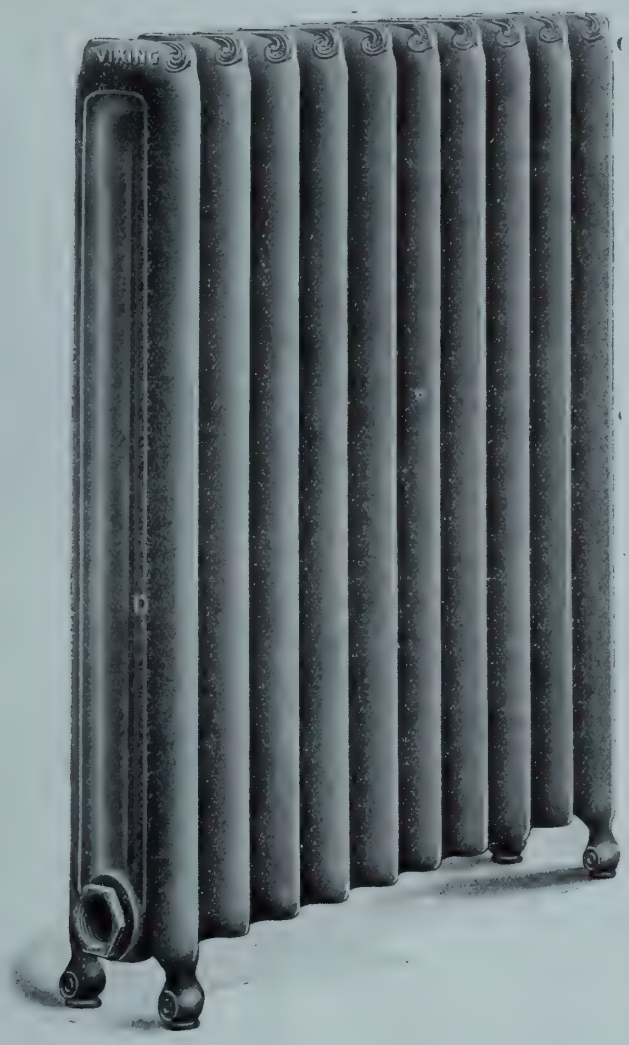
It means about $300 per month to cover urban and rural Canada. Let it be remembered that 85,000 circulation in Canada is the equivalent of 1,700,000 in the United States with its 20-times larger English-speaking population. That is, using MACLEAN'S and FARMERS' in combination gives an advertiser a circulation in Canada comparable to that of the *Saturday Evening Post* and with that of the *Ladies' Home Journal* in the United States.

We invite correspondence from all oversold manufacturers and others who want to break back into the public's favor. We would like the privilege—and solicit it—of talking over with them the whole matter of national advertising, looking forward to the preparation of a specific proposal based on their own special problems and conditions. And so we ask you to address a letter of enquiry to the General Manager of

The MacLean Publishing Co., Ltd., Toronto, Canada

With branches at: Montreal, Winnipeg, New York, Chicago, Boston and London, England

Daisy Boilers and Viking Radiators Have No Equal



BACKED BY OVER 50 YEARS OF PRACTICAL EXPERIENCE

For Efficient and Economical heating, specify Daisy Hot Water Boilers and Viking Radiators and conserve the fuel for your country by this installation.

The Daisy Boiler is manufactured only by

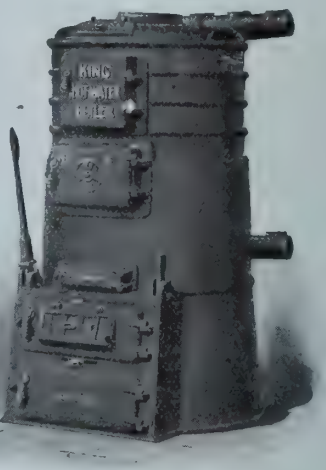
WARDEN KING LIMITED, MONTREAL

BRANCH, 200 Adelaide St. West, TORONTO

King Boilers get up heat quickly

Very shortly after the fire is lighted in a King Boiler hot water reaches the radiators. The thin, peculiarly shaped waterways in the "King" mean quickly heated water and perfect circulation. The perfect circulation causes a saving in fuel because it obviates the necessity of "extra firing" to move cold water from the radiators.

The Trade should use this quick-heating, fuel-saving argument now while fuel is scarce and high in price.



WRITE US FOR PRICES

Steel and Radiation, Limited

Head Office, FRASER AVENUE, TORONTO

304 University Street, MONTREAL **101 St. John Street, QUEBEC**

AGENCIES IN ALL LEADING CITIES

Joseph Breeden & Co., Ltd.

NEW MILL WORKS

Fazeley Street, Birmingham, England



MANUFACTURERS OF

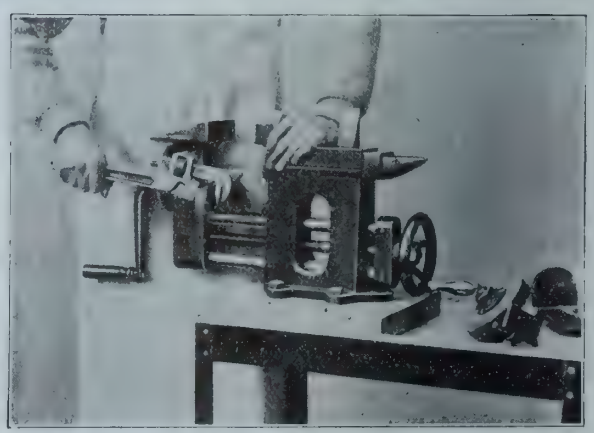
HIGH CLASS

Steam and Water Fittings

THE

Stewart Handy Worker

An Equipment All in One



WEIGHS 90 POUNDS

The Equipment Comprises——

A Pipe Vise
A Bench Vise
A Bench Grinder
A Two-Speed Drill
A Hardy Cutter
An Anvil

It's not a toy. It's a real combination of practical tools for practical people.

Write for full particulars.

CHICAGO FLEXIBLE SHAFT COMPANY

12th Street and Central Avenue

Department H.W. **CHICAGO, U. S. A.**

When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER.

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THE NEXT TIME YOU HAVE A LEAKY OR CRACKED BOILER TO REPAIR - AND FIGURE THE JOB WORTH $100 - JUST TRY $6 WORTH OF "X" BOILER LIQUID

BY using "X" Liquid the job will be FINISHED IN 30 MINUTES! You won't have anything to do but *pour* the "X" Liquid into boiler. You save your customer a lot of inconvenience and annoyance. You save yourself a lot of time—AND YOU MAKE MORE MONEY than by the old-fashioned method of tearing down a boiler and spending a week on the job.

Thousands of steamfitters are proving "X" to be a **marvelous liquid.** When poured into the boiler "X" combines with the water. Wherever it finds a leak or crack it sizzles through and is instantly changed to a solid—making a **permanent repair.** No need to know **where** the trouble is. "X" finds the trouble—and repairs it auomatically.

What is more—"X" liquid, if left in the water, PREVENTS RUST AND SCALE from damaging the inside of the system. "X" is not a cement or powder, and will not clog air valves.

Better send for a can of "X" to-day. Your jobber carries it or we will ship direct. Our money-back guarantee **protects you.**

The big concerns who use "X" regularly are an additional guarantee of the value of "X": Pierce, Butler & Pierce; U.S. Radiator; Richardson & Boynton; Crane Co.; National Radiator; Standard Sanitary Co.; Gurney Heater Co.; General Electric Co.; U.S. Government.

TRY "X" TO-DAY. Write for complete literature.

"X" Laboratories

636 Washington St. **Boston, Mass.**

"X" BOILER LIQUID

Classified Buyers Guide

Occasionally advertisements are inserted in the paper after this page has gone to press. The insertion of the Advertiser's name on this page is not part of the advertising order, but is inserted solely for the convenience of the reader of the paper

Air Line Systems.
C. A. Dunham Co., Ltd., Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Air Valves.
Beaton & Cadwell Mfg. Co., New Britain, Conn.,
Beaton & Corbin Mfg. Co., Southington, Conn.
Canadian Wolverine Co., Ltd., Chatham.
C. A. Dunham Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London, Ont.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.

Asbestos Goods.
James Morrison Brass Mfg. Co., Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Boilers, Steam or Hot Water.
Lord & Burnham Co., Ltd., Toronto.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.

Boiler Feed Regulators.
C. A. Dunham Co., Ltd., Toronto.
James Morrison Brass Mfg. Co., Toronto.

Brass Goods, Valves, etc.
Joseph Breeden & Co., Ltd., Birmingham, England.
Canadian Brass Co., Ltd., Galt, Ont.
Canadian Wolverine Co., Ltd., Chatham.
C. A. Dunham Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London, Ont.
Galt Brass Co., Limited, Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
Kerr Engine Co., Ltd., Walkerville.
H. Mueller Mfg. Co., Ltd, Sarnia, Ont.
Puro Sanitary Drinking Fountain Co., Toronto.
L. Wolff Manufacturing Co., Chicago.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Brass Pipe and Tube.
Canada Metal Co., Ltd., Toronto
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London, Ont.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Cellar Drainers.
Galt Brass Co., Limited, Galt.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

Chain Wrenches.
Trimont Mfg. Co., Roxbury, Mass.

Closets.
Canadian Brass Co., Ltd., Galt, Ont.
Canada Metal Co., Ltd., Toronto.
Cluff Mfg. Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., Ont.
Galt Brass Mfg. Co., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Standard Sanitary Mfg. Co., Ltd., Toronto.
L. Wolff Manufacturing Co., Chicago.

Country Residence Equipments.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Ontario Wind Engine & Pump Co., Ltd., Toronto.

Damper Regulators.
C. A. Dunham Co., Ltd., Toronto.

Drainage Fittings.
Canada Metal Co., Ltd., Toronto.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.

Drinking Fountains.
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London, Ont.
Puro Sanitary Drinking Fountain Co., Toronto.

Ejectors, Steam.
James Morrison Brass Mfg. Co., Ltd., Toronto.
Kerr Engine Co., Walkerville.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Enamelware.
Amherst Foundry Co., Ltd., Amherst, N.S.
Canada Metal Co., Ltd., Toronto.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Standard Sanitary Mfg. Co., Ltd., Toronto.
Port Hope Sanitary Mfg. Co., Ltd., Port Hope.
L. Wolff Manufacturing Co., Chicago.

Electric Pumping Machinery.
Empire Mfg. Co., Ltd., London, Ont.
Ontario Wind Engine & Pump Co., Ltd., Toronto.

Fittings.
Canada Metal Co., Ltd., Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Flushometers.
Canadian Brass Co., Ltd., Galt, Ont.
Canada Metal Co., Ltd., Toronto.
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London, Ont.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Standard Sanitary Mfg. Co., Ltd., Toronto.
L. Wolff Manufacturing Co., Chicago.

Floor and Ceiling Plates.
Beaton & Cadwell Mfg. Co., New Britain, Conn.,
Beaton & Corbin Mfg. Co., Southington, Conn.
Canada Metal Co., Ltd., Toronto.
Canadian Wolverine Co., Ltd., Chatham.
Galt Brass Co., Ltd., Galt.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
James Morrison Brass Mfg. Co., Ltd., Toronto.
Steel & Radiation, Ltd., Toronto.

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Galt Brass Co., Ltd., Galt.
Holstream Heater Co., Cleveland.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Pittsburg Water Heater Co., Toronto.

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James Morrison Brass Mfg. Co., Ltd., Toronto.

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Lord & Burnham Co., Toronto
Steel & Radiation, Ltd., Toronto.

Lead.
Canada Metal Co., Ltd., Toronto.
Galt Brass Co., Ltd., Galt.
Hoyt Metal Co., Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

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Canada Metal Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Port Hope Sanitary Mfg. Co., Ltd., Port Hope.

Monkey Wrenches.
Trimont Mfg. Co., Roxbury, Mass.

Packing.
Canadian Wolverine Co., Ltd., Chatham.

Packless Radiator Valves.
Kerr Engine Works, Walkerville.

Pipe and Radiator Hangers.
Beaton & Cadwell Mfg. Co., New Britain, Conn.,
Beaton & Corbin Mfg. Co., Southington, Conn.

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Canadian Tube & Iron Co., Ltd., Montreal.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.

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Chamberlain Desolvo Co., Ltd., Toronto.
Canadian Wolverine Co., Ltd., Chatham.

Pipe Cutters.
Trimont Mfg. Co., Roxbury, Mass.

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Canadian Wolverine Co., Ltd., Chatham.
James Morrison Brass Mfg. Co., Ltd., Toronto.

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Anthes Foundry Co., Toronto and Winnipeg.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Toronto Hardware Mfg. Co. Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.
Warden King, Ltd., Montreal.

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Borden Canadian Co., Toronto.
John Hall & Sons, Ltd., Brantford.
A. B. Jardine & Co., Hespeler.

Pipe Wrenches.
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Trimont Mfg. Co., Roxbury, Mass.

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Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
L. Wolff Manufacturing Co., Chicago.

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C. A. Dunham Co., Ltd., Toronto.
Galt Brass Co., Ltd., Galt.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Ontario Wind Engine & Pump Co., Ltd., Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Radiators.
Lord & Burnham Co., Ltd., Toronto.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.

Radiator Foot Rests.
Beaton & Cadwell Mfg. Co., New Britain, Conn.,

Radiator Traps (Steam).
C. A. Dunham Co., Ltd., Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

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Toronto Hardware Mfg. Co., Toronto.

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James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
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Canada Metal Co., Toronto.
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Rubber Goods
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Septic Tank Valves and Syphons.
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James Morrison Brass Mfg. Co., Ltd., Toronto.
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Canada Metal Co., Ltd., Toronto.
Hoyt Metal Co., Toronto.

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Kerr Engine Co., Walkerville, Ont.
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Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London.
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H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Trimont Mfg. Co., Roxbury, Mass.
Williams, J. H., & Co., Brooklyn, N.Y.

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Dart Union Co., Ltd., Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Vapor Heating Systems.
C. A. Dunham Co., Ltd., Toronto.
Moline Heat, Moline, Ill.

Vent Caps
Anthes Foundry, Ltd., Toronto.
Toronto Hardware Mfg. Co., Toronto.

Vitro Tanks.
Cluff Mfg. Co., Ltd., Toronto.

Vacuum Systems of Heating.
C. A. Dunham Co., Ltd., Toronto.

Water Supply Systems.
Empire Mfg. Co., Ltd., London, Ont.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Ontario Wind Engine & Pump Co., Ltd., Toronto.
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Monuments To Wolff Plumbing



Michigan Avenue, Chicago, from Seventh Street north to Washington Street.

The following buildings on this world-famous Avenue are equipped throughout with Wolff Plumbing:

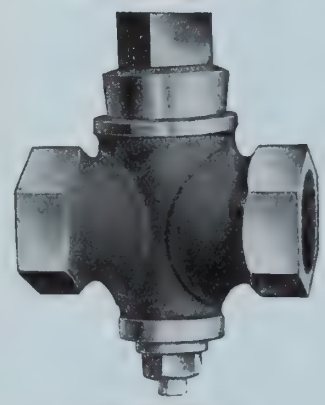
1. Blackstone Hotel
2. Congress Hotel
3. Congress Hotel Annex
4. Auditorium
5. Studebaker
6. Chicago Club
7. McCormick Building
8. Stratford Hotel
9. Railway Exchange
10. Orchestra Hall
11. Pullman Building
12. Theo. Asher Company
13. Edson Keith & Company
14. Gage Brothers & Company
15. Chicago Athletic Club
16. Tower Building
17. Ward Building
18. Chicago Public Library

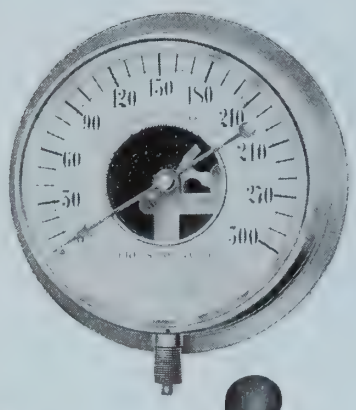
L. WOLFF MANUFACTURING COMPANY

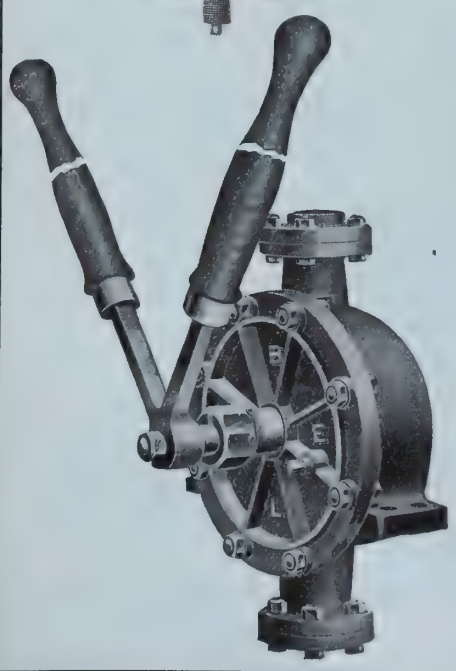
Manufacturers of Plumbing Goods Exclusively

General Offices: 601 W. Lake St. CHICAGO *Showrooms:* 111 N. Dearborn St.









FIVE WORKS—OVER 3,000 EMPLOYEES

It is our intention after the War to devote our energies to the intensive production of the following Specialities:

Gunmetal and Brass Valves and Cocks.
Steam, Water and Compressed Air Fittings generally.
Cast Iron Stop and Sluice Valves.
Semi-Rotary Pumps.
Extruded Brass and Bronze Bars.
Brass Bolts and Nuts, Studs and General Turned Work from the Bar
Cast and Malleable Iron Cocks and Pipe Fittings.
Pressure and Vacuum Gauges.
Injectors, Engine Governors.
Spraying Machinery.
Coppersmiths' Work.
"Stella" Brand Alloys, Manganese Copper, Silicon Copper, Ferro Zinc, Phosphor Copper and Tin, etc.

Business After the War

If you are interested in any or all of the lines mentioned and are in a position to take a hand in the energetic distribution of the same, please communicate with us NOW to our Head Office.

United Brass Founders and Engineers, Limited

Empress Foundry

Cornbrook, Manchester, England

WROUGHT PIPE

BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.
All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES Black and Galvanized All Sizes

Ask your jobber for CT Brand

CANADIAN TUBE & IRON CO., LIMITED
Montreal Works: Lachine, Can.

Pipe and the Public Welfare

By R. C. McWane

A Book Just Off the Press

Every sanitary engineer should be the possessor of this book. It deals with pipe making of all kinds, cast iron, wrought iron, steel, wood and tile pipe. It is valuable because it gives the users of pipe a true idea of how pipe lasts under various conditions when in service.

Price $1.00 Postpaid

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OPEN VIEW NO. 10-A.

The CEILING PLATE that's better


TOP VIEW NO. 10-A.

THE NO. 10—A NARROW FLANGE PLATE IS A STEEL HINGED PLATE. FLANGES ¾" WIDE. HIGHLY FINISHED. ESPECIALLY DESIGNED FOR TWIN CONNECTION "NARROW."

The split ceiling plate is coming more and more into use than ever and ALWAYS GIVES A NICE FINISH, because it can be attached to mains and risers at the very last, and is not exposed during completion of a building on the floors.

High quality at the right price.


Gem No. 4.

Gem No. 4 Automatic Air Valve

Made from the best brass obtainable. Pressed shell and pressed brass base which eliminate danger from blowholes, which is a fault with cast bases.

Write for catalog showing our complete line of specialties.

The BEATON & CADWELL MANUFACTURING Co.
New Britain, Conn.

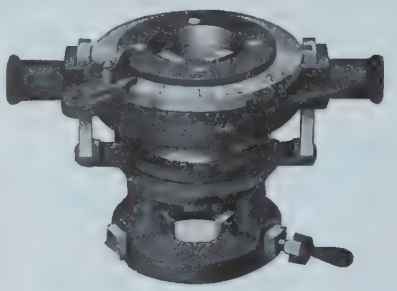
Eastern Agent: J. R. Devereux & Co., 233 St. James Street, Montreal. Western Agent: A. E. Hinds & Co., Chamber of Commerce, Winnipeg.

After the War——What?

The time to put on fire insurance is before the fire. The time to prepare for after-the-war-conditions is before peace comes.

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PIPE THREADING AND CUTTING TOOLS



Ratchet

No. 6—¼" to ¾".
No. 25—1" to 2".
No. 26—1" to 2".

Geared

No. 41—2½" to 4".
No. 61—2½" to 6".
No. 80—4½" to 8".
No. 90—9" to 12".

One Man Can Thread up to 12 Inch.

You cannot afford to expect your men to make horses of themselves. If they did they could not keep it up. Our tools save time, do better work and makes life worth living for your men.



Cuts Without Burring

No. 1 cuts from ⅛" to 1"
No. 5 cuts from ½" to 2"
No. 10 cuts from 2½" to 4"
No. 15 cuts from 4" to 6"

The Borden-Canadian Company
TORONTO, CANADA

"HAUSE" PIPE JOINT CEMENT

For steam, water, air, oil, gas, gaskets, etc. The cement that cements. Sets like gum. Allows no leaks.

The Great Value of "HAUSE PIPE JOINT CEMENT" lies in its peculiar chemical properties which permits of its hardening and expanding after the joints are made up. In making up joints it has the same effect as a lubricant on the best graphite, and while the joints may be made and broken readily, a perfectly tight joint is maintained at all times. Comes in 1-lb., 5-lb., 15-lb., 25-lb., 50-lb. cans, 100-lb. barrels. Manufactured in ready mixed and powder form. Ask your jobber for prices, or write us direct.



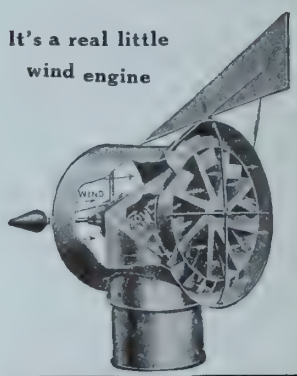
Manufactured in Ready Mixed and Powder Form.

Made in Omaha, Neb., U.S.A., by

Chas. F. Hause Mfg. Co., Inc., Omaha, Neb.

THE BICALKY

It's a real little wind engine



VENTILATOR

Is a positive suction fan that ventilates

The "Bicalky" will dispense with all auxiliary heaters on local ventilation systems.

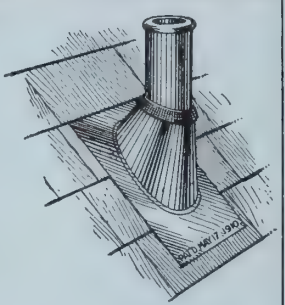
It is, as far as we know, the most scientifically constructed, self-propelled fan ventilator on the market.

Write us for full particulars.

BICALKY FAN CO.
BUFFALO, N.Y.
Canadian Sales Agents:
J. S. Chapman & Company
89 Jarvis St., Toronto

The SIMPLEX Adjustable Roof Flange

Fits any roof from ½ pitch to flat—just slide it down the pipe and it will conform with the pitch of the roof.



Trade Price 2" $1.00 4" $1.15

Made in all sizes—For sale by nearly every jobber

Simplex Mfg. Company - Chicago, Ill.
Canadian Representative; W. H. CUNNINGHAM, 98 Kingswood Road TORONTO, ONT.

No. 1 B. & C. Automatic Radiator Air Valve

Made from the best brass with cast brass base. Screwed and soldered on, and equipped with high grade carbon. All valves tested before shipping. Use these together with our famous "B & C" Floor and Ceiling Plates and insure satisfaction.



The Beaton & Corbin Mfg. Co.
Southington, Conn.
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PIPE AND THE PUBLIC WELFARE

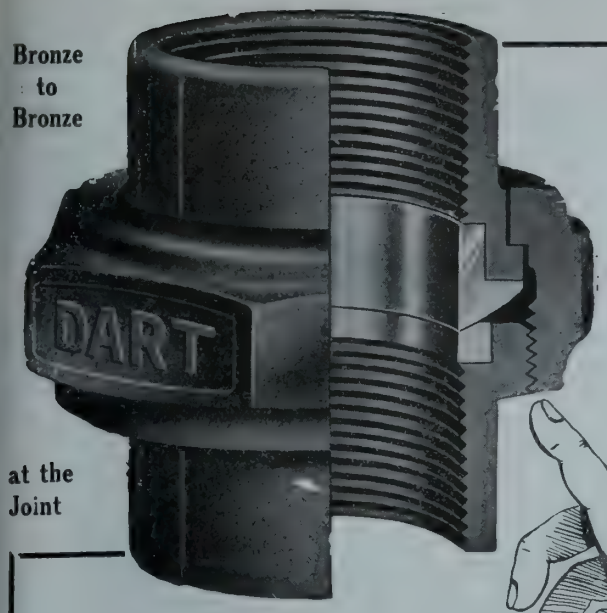
By R. C. McWANE

A Book Just Off the Press

Every sanitary engineer should be the possessor of this book. It deals with pipe-making of all kinds, cast iron, wrought iron, steel, wood and tile pipe. It is valuable because it gives the users of pipe a true idea of how pipe lasts under various conditions when in service.

Price $1.00 Postpaid

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University Ave., Toronto



YOUR JOBBER
SELLS THEM

Manufactured by

DART UNION CO., LIMITED
TORONTO

Here's insurance against pipe coupling troubles

When you commence to use Dart Unions you cease to worry over couplings. Experience soon teaches you that "Bronze to Bronze at the Joint" means a permanently tight, sure joint that won't loosen up and leak. Furthermore you find that the ball-shaped seat allows for an easy connection regardless of the alignment of the pipe.

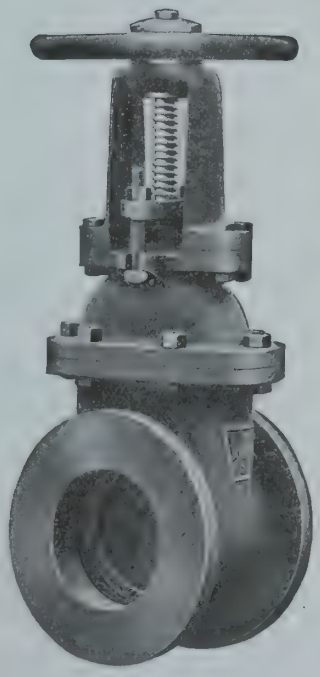
If you have never used Dart Unions, try them on your next job and see if they don't mean insurance against pipe coupling troubles.

There Are Lots of Gate Valves



advertised and sold, but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.

Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.

Approved by the Fire Underwriters Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario

GALT BRASS COMPANY
LIMITED

MANUFACTURERS OF PLUMBERS' BRASS GOODS AND APPLIANCES

CASTINGS IN BRASS, BRONZE AND ALUMINUM OF ALL KINDS

GALT, ONTARIO.

March 15, 1918.

TO THE TRADE.

At the outbreak of the War in 1914 we placed our entire Plant at the disposal of the Government, and were one of the first Manufacturers to furnish the Imperial Munitions Board with perfect Brass Parts for shells. Our quality was such that the Board induced us to double our capacity and devote our entire energies to making Munition Parts.

We are confident that our Patrons feel that in no way could we have better served them and our Country, than by unreservedly placing ourselves in the hands of the Government, thereby doing our best to help achieve the aim of every Canadian, viz: To Win the War.

With our capacity more than doubled, we are again turning our attention to the manufacture of the regular lines upon which we were engaged before the War, also to other and improved lines which we have added and purpose adding to our business.

GALT BRASS GOODS were always of excellent quality, but the requisite exactness of metal mixing, machining and finishing of Munition Parts, has been an experience that will materially assist us in turning out better goods than ever.

Each piece of our High Grade PERFECTO (Perfect Operating) Brass Goods is individually tested under Hydraulic Pressure and guaranteed as follows:-

> ANY ARTICLE OF OUR MAKE PROVING DEFECTIVE THROUGH INFERIOR METAL OR WORKMANSHIP WILL BE CHEERFULLY REPLACED WITH TWO GOOD ONES AT NO CHARGE

About April 1st., when we have the goods on our shelves ready to ship, our Salesmen will go out and we will appreciate receiving a share of your business.

Yours truly,

GALT BRASS COMPANY, LIMITED.

SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

Vol. XII. Publication Office, Toronto, April 1, 1918 No. 7



No. A440 Empire Self-Closing Basin Cock, Ball Bearing, China Button, Four Arm Handle, Best Red Bronze.

Water Saved Means Fuel Saved

In offices, factories, schools and all public buildings much water is wasted through failure to close faucets. It costs money and good fuel to pump this water that runs away but the waste will continue so long as it's left to the individual to close the tap.

The effective means of preventing waste is Empire Self-Closing Basin Cocks. Correctly designed and equipped with ball bearings, they operate easily, close quickly and tightly, will not stick, and stand up well under hard usage. They are of best red bronze, the working parts being made from a special formula.

"Do Your Bit" to make the fuel situation less acute next winter by installing as many as possible of these water savers.

Empire Manufacturing Co., Limited

LONDON :-: TORONTO

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While



A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for BEAVER BRAND CAST IRON ENAMEL WARE

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

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MANITOBA and NORTHWEST:
E. B. Plewes, 120 Lombard St., Winnipeg

CANADIAN CONSOLIDATED RUBBER CO. LIMITED
DOMINION
RUBBER SYSTEM
AND ASSOCIATED COMPANIES

For more than half a century our Canadian Rubber Factory has been manufacturing Rubber products. That experience has taught us how to produce qualities that will stand the test of wear.

Every detail in manufacturing is carefully supervised and the greatest care is exercised in the choice of materials. Our facilities for buying, manufacturing and distribution make it possible to produce mechanical rubber goods that represent the best possible values.

As a result, the Dominion Rubber System products are recognized throughout Canada as the standard by which to judge Rubber qualities and Rubber values.

You can easily prove our claims by writing direct to our nearest branch for any need in Rubber. Prompt attention is given to all enquiries.

Canadian Consolidated Rubber Co.
Limited

Head Office . . MONTREAL

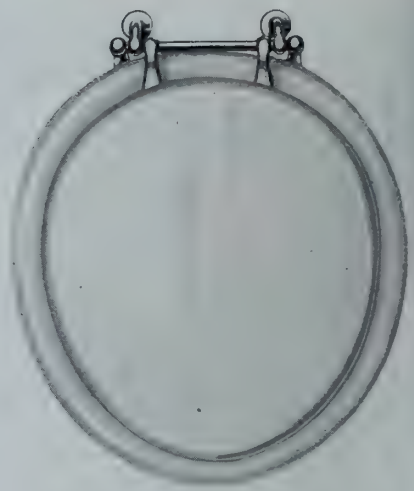
Service Branches at Halifax, St. John, Quebec, Ottawa, Toronto, Hamilton, Kitchener, London, North Bay, Fort William, Winnipeg, Brandon, Regina, Saskatoon, Calgary, Lethbridge, Edmonton, Vancouver, Victoria.

"BLANCO"



B25—Blanco Close Ruff. S & C with concealed hinges

White seats that will not craze, discolor or open at the joints



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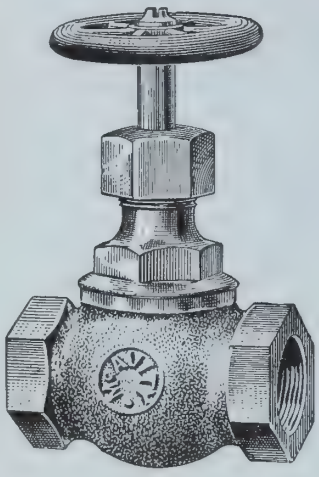
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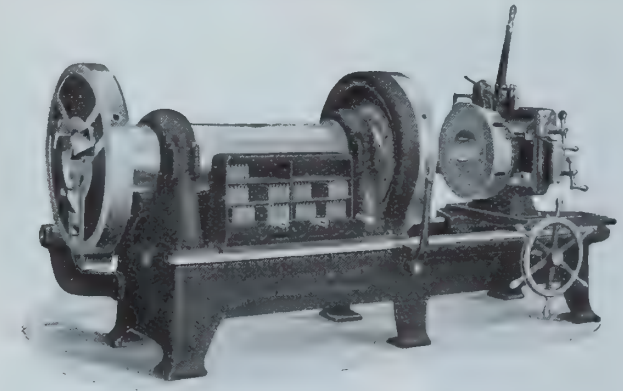
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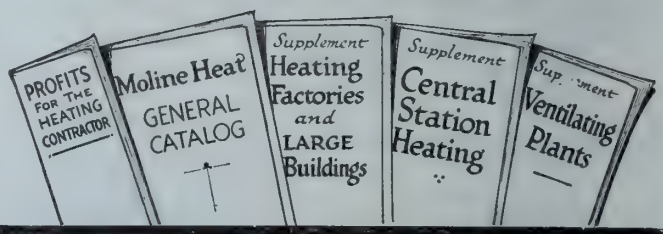
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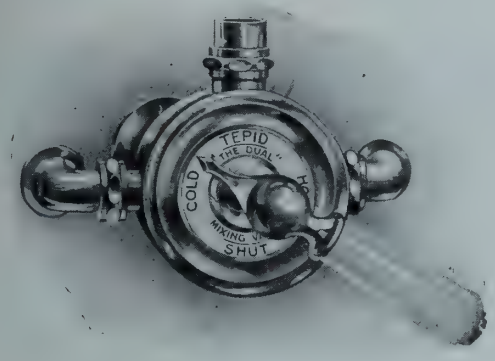


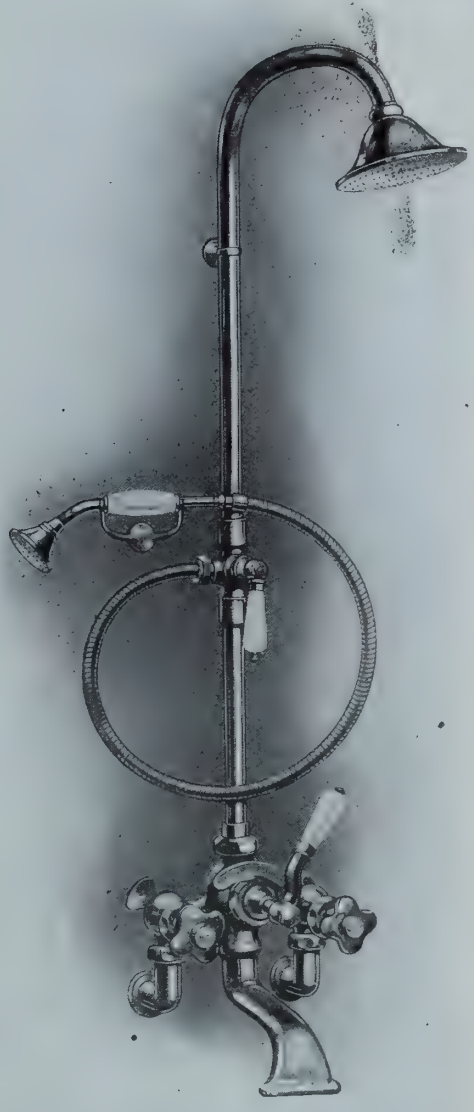
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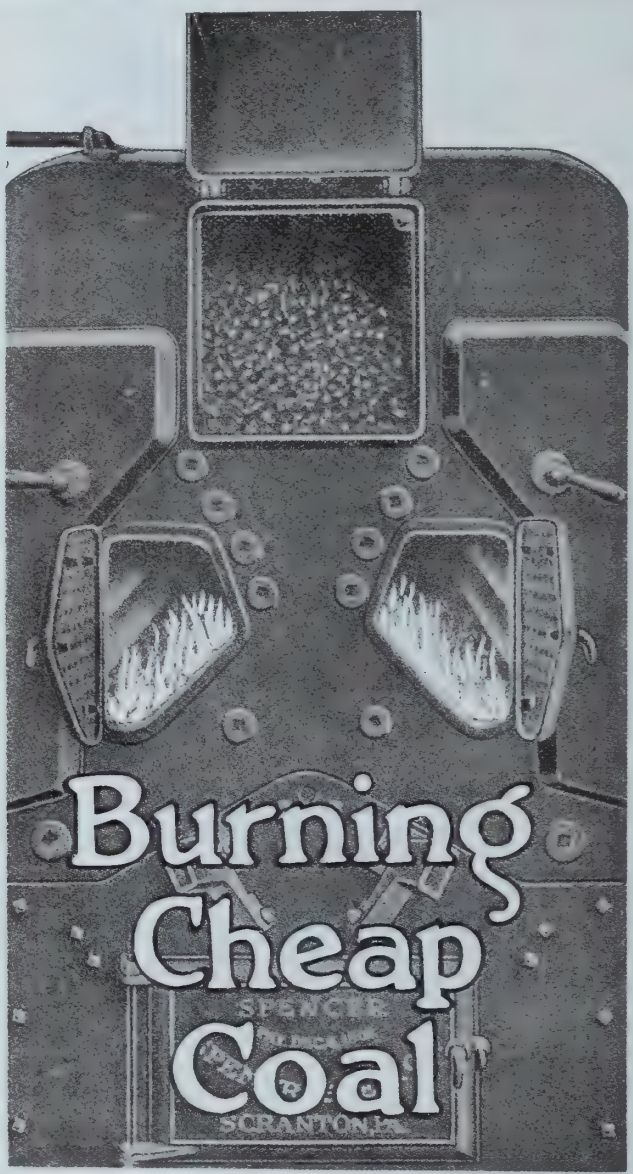
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We can tell you something about fuel in the various districts of Canada as this Spencer Boiler is successfully operating on every known kind of fuel throughout this Continent, and the reason is to be found in the water-jacketed magazine, and the patented shaped arched grates.

These Spencer features are protected by Canadian patents, and the boiler is simplicity itself in construction as well as operation. Years of experience make the Spencer not only the pioneer Self-feeding boiler, but the masterpiece of the present age.

In other words, the construction of the SPENCER is such that all freak ideas have been entirely eliminated.

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The SPENCER IS A MADE-IN-CANADA BOILER. The Spencer is made in fourteen sizes for hot water heating, and twenty-seven sizes in the water-tube constructed boiler for steam heating purposes.

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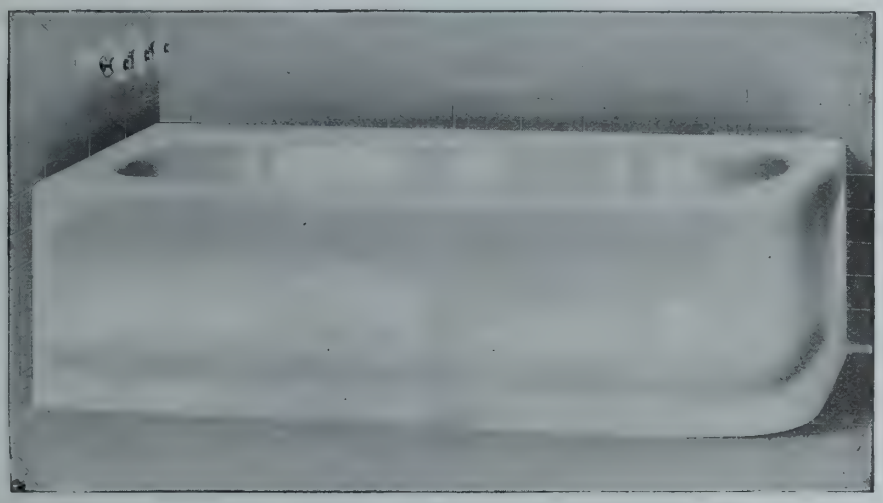
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"Perfection" Built-In Baths

Made in One Piece Enamelled All Over



These Baths represent the last word in design and finish, and are made to build into Right or Left Hand Corner or into a Recess.

The "Perfection" Built-in Bath is only 17½ inches high, therefore convenient. It builds into walls and floors, the absence of all dust-collecting cracks and corners, meaning bathroom sanitation.

Made in 5 and 5½ foot sizes.

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4 Beaver Hall Square

Calgary:
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Vancouver:
847 Beatty Street

"MADE IN CANADA"

SANITARY ENGINEER
PLUMBER AND STEAMFITTER OF CANADA

Vol. XII. TORONTO, APRIL 1, 1918 No. 7

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AN IMPORTANT ANNOUNCEMENT

TO THE TRADE:---

We beg to announce that the manufacture of Vitro Closet Tanks which we have hitherto carried on at 81 Sterling Road, Toronto, will in future be continued by The Galt Brass Co. at Galt, Ont., which company we have recently taken over, and who, also, will, as before, manufacture a full line of Plumbers' Brass Supplies.

We can assure our friends that the high quality of Vitro No-Trouble Tanks, both as to finish and fittings, will be sustained, and if at all possible excelled.

We thank the Trade for the support accorded the Vitro Tank in the past, and bespeak a continuance of same for the future.

All enquiries regarding Vitro Closet Tanks should be addressed to, Galt Brass Co., Ltd., Galt, Ont.

CLUFF BROTHERS

85 CHURCH STREET **TORONTO**

Interesting to Master Plumbers

OUR new Booklet illustrating "Port Hope Enamelware" is just from the press and is in the process of distribution.

If our mailing list is complete every master plumber in Canada will have a copy, but there is a possibility that some may not be delivered. If yours doesn't come along in a few days write this office and we'll gladly send you a copy. It is well worth having.

We call it a Booklet but it is really a Catalogue in miniature form and contains a complete line of modern plumbers' enamelware, suitable for any home. The illustrations are well set up, clear and distinct and present our fixtures in an attractive form, dressed and trimmed with suitable brass work. Each fixture is carefully described and the price quoted is for the fixture and trimmings complete, subject to a discount which gives the contractor a reasonable profit.

It's just the kind of a book that the merchant plumber can put in his pocket when he calls on a customer to interest him in a new Bathroom, and he can leave it with his prospect to remind him of his interesting talk, knowing that he can get another copy or as many copies as he likes.

The Booklet is built as a help to master plumbers in conformity with the policy of this Company and is the first of a series of Booklets which the Company intends to issue, all of which the plumbers will find useful in the development of new business.

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234 Beaver Hall Hill

SANITARY ENGINEER

VOL. XII MARCH 15, 1918 No. 7

Time is Money: Then Charge for It

Sanitary and Heating Engineers Should Charge For Their Time and Advice Given—Two Typical Cases in Which Valuable Time Was Occupied—Suggested Method of Collecting Such Charges

WE have many times called our readers' attention to the fact that they are either wasting time or adding to their overhead expenses when they give free advice or estimates to the public. The advice generally given free is valuable, and the ability to give it is acquired after long years of study. In a recent issue there appeared an editorial telling of one case in which members of the craft have for a number of years made a practice of charging for their advice.

Discussing this matter a few days ago with the writer, two members of the craft expressed a desire to find a plan by which this could be done. Here are two typical cases which occurred recently, and in which time and advice certainly should have been paid for. One was that of trouble in a heating system, the other a defective plumbing job; the water pipes were always freezing and very poor hot water service was procured.

One morning a certain heating engineer received the following letter:

Mr. Adamson, Heating Engineer,
Toronto.

Dear Sir,—About four years ago we had our present hot water heating system installed. It worked fairly well for two winters, but since then has not given anything like the satisfaction it did at first. Would you please call at above address and give me your idea as to what is wrong and what in your opinion should be done to remedy matters.

Your very truly,
WM. BROWN.

Mr. Brown's house is nearly three miles away from Mr. Adamson's establishment. The latter owns an automobile, so he went up next morning to see Mr. Brown's troublesome heating system and, being a very careful man, took great care to examine every nook and cranny in which a pipe was situated.

He made notes of the number of radiators, the size of the furnace, the location and length of the horizontal runs of pipe, the condition of the furnace, the quality of coal burned, and the condition of the fire, dampers, etc.

Then he cast his weather eye on all the windows, measured them up, examined the expansion tank, etc.

What did he find? First, that a No. 4 hot water furnace was installed, rated at 650 square feet of radiation: The furnace and piping were not covered; there was a big sunroom, all glass, heated by two 50-foot radiators; and in all over 700 sq. feet of radiation was connected to the furnace.

It transpired that the furnace gave splendid satisfaction, as stated in the letter, but that the two 50-foot radiators had been added the winter before last. Then it was found that the window space was over 20 per cent. more than normal. So our friend Mr. Adamson went back to the office after spending about four hours of his time and wrote Mr. Brown that the only thing to do would be to instal a larger furnace. He then went on to explain why and at the same time quoted a price.

This did not satisfy Mr. Brown, who

MY SPECIALTY: STEAM AND HOT WATER HEATING

TRIAL SOLICITED SATISFACTION GUARANTEED

W. F. ADAMSON

Heating Engineer and Contractor

Phone Junc. 2599

25 Pauline Ave.

Toronto, March 15, 1918.

Wm. Brown, Esq.,
Danforth Road,
Toronto.

Dear Sir:-

Complying with your instructions of March 4th that I inspect your heating system and advise what in my opinion would remedy the trouble you are experiencing with the system, I beg to submit to you the following findings and report:-

First

I found that the furnace is a No. 4 _____. It is rated at 650 sq. feet. That since the furnace was installed you have added a sun room to your house and have also made an addition to the radiators, to the extent of 100 sq. feet. Making the total radiation load on the furnace of 710 sq. feet which is more than the total rating of the furnace.

Second

That neither the furnace or the piping are covered which must result in a great amount of heat loss.

I would advise you to have a No. 5_____ furnace installed and also to have all the pipes and furnace covered with _____boiler and pipe covering.

If you decide to follow my advice, I will be only too pleased to submit you a tender on the work, and I will guarantee the work and prove to you a saving of fuel as well as an efficient heating system.

Enclosed please find my charges for report which will be deducted from contract price if accepted.

Yours very truly,

W. F. Adamson

Suggestion for letter to accompany bill of charges for services rendered.

called in another plumber to see what he would say.

"Now, Mr. Editor, how would you handle a situation like that?" asks a reader.

To meet such a case we reproduce herewith a form that could be used, filled out in the manner shown, with a letter accompanying same. It will be seen that a charge is made for a report that is rendered and for certain practical information which was given. The ability and knowledge necessary to enable one to give this information requires years of study and experience, and in all reason should and can be honestly charged for. It will, however, be noted that a condition is attached by which if the tender is accepted the charge for professional advice is deducted from the estimate.

There should be a letter accompanying the report that might read something like the fac-simile of letter shown herewith, as well as a regular invoice for charges made.

The very same arguments apply in the case of another call made for the services of a certain sanitary engineer.

In this case the domestic water supply was poor, the w.c. tank made an awful noise at times; at other times it took a long time to fill; the owner also complained that the sink kept stopping up, and once in a while the w.c. waste flowed up through the cellar drain.

Our sanitary engineer found out the troubles and reported verbally, along with an estimate of cost to make the necessary improvements.

The time taken in this instance was 2½ hours, with car fare to and fro; but further than this, this sanitary engineer in the ordinary run of his work was to have called on a job where he had men working. The men expected him, and some question had arisen that required explanation before these men could go on with their work, and something like 1½ hours' time for two men and two helpers was wasted. This latter loss of time could not very well be charged to anyone, which makes it all the more imperative that all services actually rendered should be charged and paid for.

It is only honest to charge the party who gets the service, no matter in what form that service may be. Further, when a charge is made for services rendered, such revenue would have a tendency to reduce overhead expenses.

The editor would be very pleased to have the readers of SANITARY ENGINEER send in any comments on this question. There is no doubt about it the question will have to be squarely faced if the trade are ever to be appreciated by the public.

Phone Junc 2599 STATEMENT SATISFACTION MY MOTTO

In Account with W. F. ADAMSON

CONTRACTOR FOR EVERY KIND OF
STEAM and HOT WATER HEATING

25 Pauline Ave.

Toronto, March 15, 1918.

M Wm. Brown, Esq.,

Danforth Road, Toronto.

TERMS Net Cash 8 per cent charged on all Overdue Accounts

1918			Debit	Credit	Balance
Mar.	5	To Inspecting and Reporting on Hot Water Heating System at above address.	$ 6.00		

Suggestion of invoice to accompany letter and report referred to.

Master Plumbers Curl

Montreal Association Plays Its Annual Series—Ballantyne and Watson Come Out on Top

IT was a roarin' afternoon, that of March 14th, when the master plumbers of Montreal threw aside their blueprints and specifications, their meltin' pots and ladles and wended their way to the Caledonia Club. For this was the date of their annual curling series and every worthy "Scot" was there and took up his broom of victory with a zest that knew no lack.

The first round was that of a regular two end rink match and this was played with the following line-up:—

Rink Competition

T. Bain, J. Watson, Jas. Griffin, Jas. Ballantyne, (Skip)—9.

P. C. Ogilvie, J. Gordon, J. Buckham, W. R. J. Hughes, (Skip)—5.

The arrangement here called for the playing of a second game by the winning rink and after a short period for refreshments (mostly dry) the following worthies took to the brooms again with real relish and with more fire in their eyes than they were wont to show at the beginning.

Doubles

J. Watson, Jas. Ballantyne, (Skip)—8.

T. Bain, Jas. Griffin, (Skip)—5.

Matters began to warm up in this competition and some braw stanes were 'put.' There was much friendly by-pass. "The pipes are frozen in the Caledonia Rink." Some shot, John"—"Tae strong on the stanes mon"—"Com awa' noo John and add ane ta your reputation." "Some sweeper boy," etc.

During the progress of the stone throwing one of the stalwarts was somewhat inconvenienced through an accident to his wearing apparel although his scoring was so fine that his usual sensitiveness was relegated to the background for the time being. As a matter of fact he had every reason to be proud of his record and standing in the finals.

The singles were entered by Jas. Ballantyne and John Watson. Here was some exhibition of curling. Interest had centered around these two players as the previous game wore on to a finish and the score of seven to five indicates good playing.

In addition to securing the winning score in the final singles Jas. Ballantyne was able to tally the highest number of points in all games and was awarded a silver cup. "Some cup, believe me," says Mr. Ballantyne, "and a good man it will be that can win it from me."

As second in the score John Watson received a fine pair of gold cuff links and these he has consented to exhibit for the admiration of all who care to see them. Some proud winner is John Watson.

The cup for this competition was donated by the Dominion Radiator Co. as were also the gold cuff links.

A set of military brushes and a fine large turkey were donated by the Thos. Robertson Co. and a new competition was thereupon arranged.

The finals in this gave the honors to W. R. J. Hughes and J. Buckham. The former took the turkey and the latter the military brushes.

Mr. Buckham states that, while he cannot make the best use of these himself, being bereft of much of his old-time head covering, he has some worthy progeny at home who will enjoy their use.

Through the courtesy of president James Griffin, F. Miles Kinsman and A. H. Illsey were asked to attend as representing SANITARY ENGINEER and were royally entertained.

Ottawa Technical Classes

A Short Synopsis of the Work Being Carried on in Connection With Plumbing and Heating Classes at Ottawa—Many Students Taking Advantage of the Splendid Opportunity Afforded Them

AFTER three years of hard work calling upon members of the trade, discussing the question of evening classes for the plumbing and heating trade, as well as taking the matter up with a number of journeymen and apprentices, a splendid start was made last fall.

Reviewing the work done so far Mr. A. W. Allen of Ottawa writes us as follows:

The first year that evening classes were started in Ottawa I went to the collegiate institute to see if any provision had been made for the formation of a class in plumbing and heating. Owing to the absence of an instructor I undertook the job of preparing a course of lectures. Several members of the trade were present and we talked the matter over with a view to starting a class the following season. Through the lack of co-operation nothing materialized until last summer when Mr. D. A. Campbell approached the local union of plumbers and steamfitters of which I have the honor to be one of the officers. We formed a committee to discuss the matter with Mr. Campbell and finally got the class placed on the school curriculum. The members of the union gave the movement their hearty support and several enrolled as students. The attendance up to the end of December was 193 out of a possible 258, which considering the outside attraction provided by the elections speaks well for the interest of the students. The course of lectures given covers as far as possible the study of plumbing and sanitation from both a theoretical and practical standpoint, going into the most minute detail on subjects which are of value and giving a thorough explanation of all the mathematical calculations which are met with in the average man's experience.

Questions on any subject are welcomed and answers based on the lecturer's own experience and the writings of the best authorities are freely given. I think we have disposed of all the hoary old trick problems but we get one every once in a while yet. Owing to the absence of an instructor for a class in heating and ventilation the applicants for this class were advised to join the plumbing section so that we are devoting a part of our time to the study of this subject.

The syllabus of the lectures is as follows:



A few of the pupils of the sanitary and he ating engineering classes at the Ottawa Technical School. All these students are actively engaged in the trade and Mr. Allen, the instructor, is also a practical trained man.

Mathematics

Multiplication, division, subtraction and addition of decimals, decimal fractions, square root. Calculation of areas. Capacities, weight of water in pipes and tanks. etc.

Sciences

Heat and temperature. Effect of heat on solids, liquids and gases. Boiling point of water under pressure and in vacuum. Effect of pressure of gases. The atmosphere, its pressure and composition. Atmospheric, mechanical and hydraulic pumps, metals, solders and alloys.

A full description of the process of manufacture, composition, properties and characteristics of all the metals handled in the trade, water and water supply.

Composition, sources of supply, qualities of various waters for domestic use.

Sources of pollution, simple tests for pollution, wells, "deep and shallow."

Bursting of pipes by frost and water hammer, how to prevent same.

Thawing of frozen pipes, etc.

Pneumatic water supply systems. How to calculate capacity and size required. How to install and operate same.

Drainage and Venting

Various systems in use. Sizes of pipes to use, pitch required, fittings, connections to waste, soil, vent and rain water lines, sewer connection, main house trap.

Crown, continuous and circuit venting, local vent roof terminals, etc.

Sewage Disposal

Septic tanks, cesspools, filter beds, filtration and purification of water supplies.

Sanitary Appliances

Selection of suitable fixtures, various types of water closets, traps, etc., water seal, how it may be destroyed, etc.

Hot Water Supply

Theory of circulation, range, furnace and gas heater connections, multiple connections, tank and pressure systems.

Heating

Hot air, hot water, high and low pressure and exhaust steam, vacuum and vapor heating, gravity and accelerated hot water systems. Figuring radiation by "Loss in B. T. U." method by the various accepted calculations and by the "rule of thumb 12, 10, and 8 method."

Calculation of pipe and riser sizes, laying out of jobs, etc.

Ventilation

Plenum and vacuum systems. Amount and quality of air required, humidity and its relation to health.

The object of this class is to supply the highly necessary technical training which cannot be obtained in the shop, and inculate in the rising generation of journeyman and master plumbers and steamfitters the desire to study and search for information outside their own experience, also to teach what to study and where to go for the information desired.

The entrance fee of $2 may be counted as nothing as it is returned to each student who attends 85 per cent. of the lectures from the date of entry. So that the cost of regular attendance amounts to only car fare.

TORONTO SOCIETY

Toronto Society of Domestic Sanitary and Heating Engineers held their regular monthly meeting on Wednesday, March 20th, in the Canadian Foresters' Hall, 22 College Street, Past President Fred H. Gentle presiding. Lou Palter was introduced to the members present on the occasion of his initiation.

Messrs. Wimpenny & Byrnes were approved of as prospective members in the society, their applications having been duly received.

Correspondence as received from Messrs. Harry Ruddick, Harry Griffiths and Albert Crowne, members of the society over in France doing their bit, was read and each one expressed their thanks to the members for the comforts sent them at Christmas by the society.

Chairman Harry Farthing of the entertainment committee was instructed to arrange for a monthly dinner, for the members of the society. Chairman Farthing and his co-workers, Messrs. Charles Chapman, Patrick J. Hayes and Hector Mashinter, promise all hands a real good time at an early date.

Public comfort station data as received from the Public Comfort Station Bureau, New York, were referred to the chairman of the sanitary committee for attention.

A material exchange bureau was inaugurated for the members, wherein all surplus stock could be listed with the secretary.

The Allied Ender Clubs of the Toronto Society held a very enjoyable get-together at Young's Lunch, last week, at which fifty of the local craft partook of all the good things included in the chicken dinner provided for the occasion. Messrs. Farthing, Chapman, Waterman, Allison, Lillie and Secretary Frankland spoke during the evening, and all hands voted for a repeat at an early date.

The East Enders' Club held a most successful meeting on Thursday evening before Good Friday. A good representation of the members of the craft from the east end were present, and considerable progress was made in the affairs of the club.

The seventh annual meeting of the Ontario Society of Domestic Sanitary and Heating Engineers will be held in the Canadian Foresters' Building, 22 College street, Toronto, on Friday, April 5th, 1918, commencing at 10 a.m., in the office of the Toronto committee. The directors and chairmen of committees will submit reports of their work for the past year.

President J. R. Maxwell extends a hearty invitation to the craft throughout the province to attend the above meeting.

A WARNING NOTE

By Wm. C. Groeniger, chief plumbing inspector for the State of Ohio

Our country is at war. War has always brought ravages of disease and its tremendous demands in service and in cash. With this comes the tendency to let down in the protection of the home of the worker. News service already advises action of this kinds as follows:

"Plumbing rules modified by a board of health to aid building. Owing to the high cost of building material and the present demand for houses, the board let down the bars regarding the plumbing requirements in residences hereafter to be built."

It would seem as though the real estate profiteers are taking advantage of the war to remove the factors of safety in order that they may sell buildings in which the only recommendation of the plumbing is its cheapness.

Are you men who have worked so hard to achieve legislation for the protection of the public health going to permit these slackers to delay or weaken our country's chances in winning this war? Upon the environment of the munition worker will depend his efficiency and whether in the home or factory, his sanitary surroundings should be the best. Upon the efficiency of the munition worker will depend the rapidity with which guns, ammunition and supplies are sent to our boys in the cantonments and "over there."

Hundreds of thousands of lives depend upon the efficiency of our workers and not for a moment can we tolerate modification of sanitary regulations, either in the home or factory, that might impair his efficiency.

State legislators are in session, new councils have been elected, and new city officials have taken office. Eternal vigilance is the price of liberty. Call out the guard. Entrench your pickets and remove the camouflage from the false position of those who for selfish purposes would open the flood-gates for disease and death.

Teach these slackers to remember above all things that the cheapest plumbing is not the most economical plumbing. The true state of affairs is just contrary. It may be well to economize in most other things, when economy is necessary, but never try to save by cheap plumbing. By so doing you are cheating yourself in the most direct and disastrous way. You are buying the most expensive plumbing, for poor plumbing is an extravagance, if not an affliction.

It is difficult to convince the average builder of a house that the best plumbing, both materials and labor, are the cheapest. It is similarly difficult to convince him that the best workmanship is the cheapest and most economical. The average builder, even when more or less

(Continued on page 30.)

Winners of Laundry Tub Competition

Readers of Sanitary Engineer Took a Great Deal of Interest in This Competition, as Proved by the Large Number of Suggestions Sent in and the Trouble Taken to Arrive at the Name They Suggested

IF every reader of SANITARY ENGINEER would take as much interest in the regular business transactions as was in evidence in connection with the recent competition conducted by the Canada Metal Co., at which time they asked the readers of SANITARY ENGINEER to suggest a name for their new tub, and for which three fifty-dollar Victory bonds were awarded for the best



ROY E. BELYEA.

three names, we would find that there would be more names with higher ratings in Dun's and Bradstreet's than is the case to-day.

Of course there was a fifty-dollar bond in it for the winners, and it was very good business on the part of the Canada Metal Company to get the assistance of the trade, etc., etc. It showed also that the Canada Metal Company had no small amount of confidence in the readers of SANITARY ENGINEER and it also showed that readers of SANITARY ENGINEER do read the advertisements and that is just as it should be. Why? Because there is not one single advertisement appears in the paper that is not worth to the readers far more than the value of a Victory bond. We want every reader to keep this in mind and read every advertisement as well as every article.

But we are wandering away a little from the competition and the story in general.

Just by way of giving our readers an idea of the trouble taken by the winners, we are publishing the letters of two out of the three winners.

How Names Were Arrived At

Roy E. Belyea stated that the way he figured out his suggestion was this: "I simply read all the good features claimed for the tubs. I knew if there was one fixture more than another that needed improving, it was the cement laundry tub. I also knew that if the claims made for the new tub were reasonably true that it was surely on a much higher plane than any other tub ever sold the trade, and was an aristocrat in "laundry tubdom." I believe if we plumbers were more dignified and more aristocratic we would be respected more. "So," says I, "Aristocrat's the name I'm going to send in, and I did." With those remarks from "Roy" we will turn to the suggestions sent in by Herbert E. Shade of Victoria, B.C., which read as follows:

"After carefully examining the advertisement and reading the claims made, etc., the clear way in which the essential features are brought out, I feel an inspiration which seems to shout out:

(1) **SUFFICE**
Sanitary
Unification
Faultlessly
Furnished
In
Clever
Essentials

or (2) **UTMOST**
Unequalled
Triumph
Made
On
Stationary
Tubs

or (3) **EPOCH**
Every
Principle
Of
Cleanliness
Harnessed

These are Lloyd Georgian days, and in view of this I beg to submit also those two fine old Welsh words:

(4) **TLWILT**
The
Last
Word
In
Laundry
Tubs

or (5) **ATWESE**
A
Tub
With
Every
Sanitary
Essential

Yours very truly,
HERBERT E. SHADE.

In conclusion we might quote a letter from the Canada Metal Co. which proves the efficacy of SANITARY ENGINEER as an advertising medium:

Toronto, March 25th, 1918.

Editor SANITARY ENGINEER:

Dear Sir,—You may be interested to know that we have this day received a suggested name for our new laundry tub from Sgt. J. H. Kelly, Canadian Engineers, "somewhere in France," who states that he was a master plumber and in business for eighteen years in Canada.

In his letter he further adds that he has just received a copy of the SANITARY ENGINEER and noticed our advertisement in reference to the Victory Bonds for suggesting a name for our new laundry tubs.

We give you this information thinking that you might be interested to know how some of the old sanitary engineers like to keep in touch with trade conditions through various trade journals, even though they are fighting for King and Country.

We might further add that we have had hundreds of replies from all parts of the Dominion of Canada.

Yours very truly,

THE CANADA METAL CO., LTD.
Per H. C. Crow.



HERBERT E. SHADE.

The Canada Metal Company desires through SANITARY ENGINEER to cordially thank every member of the trade who took an interest in the competition.

A Warning to Every Member of the Trade

Don't let the jerry builder get his first word in.

He's already working on the councillors and aldermen throughout the Dominion.

He is trying to have plumbing by-laws repeat so as to lower quality of plumbing fixtures.

He is posing as a benefactor to the public, but is no better in spirit than Kaiser Bill.

He harps on the cost of plumbing and plumbers' bills, and would have every home a junk pile in no time.

He forgets that sanitation and sanitary appliances are as necessary to win the war as bullets.

He forgets that civilization advances only as sanitation and sanitary engineering develops and improves.

But he does not forget that he is crying cheap, cheap, so as to fatten his bank account as well as the undertaker's.

We know he's on the job because we have been so informed from a number of locations, both in Canada and the United States.

If you hear the slightest rumor on this matter let the Editor know; he's on the job every minute.

A Warning to Every Manufacturer

Don't cater to the cheap jack.

Don't make your goods to meet the price.

The price is soon forgotten, but the service of good goods is an everlasting remembrance.

Don't allow the work of the jerry builder to get under the hide of the trade.

He can only do so if you make inferior goods to meet his requirements.

EDITOR.

Making Most of the Fresh Air Pipe

How to Utilize it to the Full Without Impairing its Efficiency—Some Radical Ideas on Vent, Waste, Soil and Drain Pipes Generally—Can Mathematicians Solve Our Re-vent Problems, in Combination With Practical Common Sense?

By Horace Nixon, Saskatoon

I HAVE been looking for discussion on Mr. Smith's article in the December first issue, but none has been forthcoming so far; perhaps the reason is that so few are nowadays interested in the breather or fresh air pipe, the main house traps having been, rightly, I believe, relegated, by most modern sanitarians, to the limbo of the past.

Being laid aside with a badly wrenched shoulder for a few weeks I have been giving some thought to this, along with other problems, and as Mr. Smith surmised there appears to be decided objections to some of the proposals he puts forth.

Increase Its Utility! Sure

Now, with regard to increasing the utility of the breather, there can be not the slightest objection to connecting back vent pipes to the breather, always providing:

1. That the breather is of the same sectional area as the trap it protects.
2. That the breather is not so long that compression, caused by the resistance of the residual air plus friction on the walls of the pipe on the air being expelled by discharges from fixtures above, will not produce sufficient back pressure to blow the seal of the trap or traps of the basement fixtures so connected.
3. That the back vent pipe can be carried up vertically to a point above the top of the fixture and then graded upwards to the point of junction with the breather.
4. That the point of junction is sufficiently removed from danger of freezing up.

N. B. It must not be forgotten that compression starts as soon as the discharge of the closet passes the lowest combined waste and vent that is connected back into the stack, this in reference to No. 2.

Do Not Decrease the Efficiency

Now, regarding the size of the F. A. pipe or breather; it should be the size of the trap it is installed to protect, and that trap should be the size of the main house drain. Of course main house drains are often absurdly large in proportion to the work they have to do.

But no breather should be of less diameter than the main soil stack if there is a closet on the system, as the discharge therefrom forms a diaphragm across the stack and expels all the residual air, below its point of ingress, from the soil stack, drain and breather, so that, if the latter were constricted the air compression, before blowing the seal of the main house trap, would be liable to blow the traps of fixtures in the kitchen or basement.

In determining the size of the breather, the number of fixtures is, in my opinion, negligible; the size of it should be determined by the size of the main drain, which should not be larger in sectional area than the sum of the areas of all stacks down which discharges might be precipitated at the same moment of time. Of course, with proper relief vents, the drain may be safely installed considerably less than the relative proportion of all stacks going into it.

Now, as to the proposal to increase the length at the same time as its area is diminished, I feel that Mr. Smith has not given the amount of thought to the subject that one might infer from his second par.; there would be little objection to taking the fresh air pipe up to the roof, as is, in fact, the custom, on best work in London, England, providing it were not decreased in area or retarded by bends, but Mr. Smith does not need to be told that the column of air to be displaced in a smaller pipe by a discharge from a larger one would have a velocity inversely greater in proportion to the reduction and that that velocity would be also subject to a proportionally greater co-efficient of friction in relation to the reduction, which every added foot of pipe would accentuate. The result of such treatment would be that sufficient back pressure would, under most circumstances, be developed to blow out the contents of any traps on the ground floor or basement.

These conditions are not, I think, taken sufficiently into account in apportioning vent pipes, in which, especially for high buildings, we must diminish velocities and allow for friction: nor in waste and soil pipes in which the latter property could be used to advantage.

The solving of these problems is, in my opinion, merely a matter of mathematics, the neglect of which science by sanitary engineers, coupled with the bull-headedness of a few of our plumbing inspectors has retarded. The old rule-of-thumb method of reasoning still obtains in the majority of places, and all that some of the older installed plumbing and sanitary inspectors who have the compiling of plumbing regulations can advance, in the computing of main soil, waste, drain and vent pipes, is the argument that if 16 fixtures of a certain sized waste require a four inch stack, thirty-two fixtures must have a six inch stack. Now, for maximum use that would appear to be a very safe way of calculating, but you will notice a very radical assertion in my appeal above to preserve the efficiency of the breather, (if you will stick to the breather.) The subject of my next part will be "How shall we compute the sizes of soil, waste, drain and vent pipes?"

"Is the number of fixtures negligible?"

LABOR AND MATERIAL

Addressing the members of the British Empire Producers' Association, Mr. J. Hodge, M.P., Minister of Pensions, said, that, while he would permit no expenditure to stand in the way of repairing the damage of war so far as our sailors and soldiers were concerned, he would endeavor to prevent all waste in his department. The money paid in pensions would be a small matter compared with the restoration of industry after the war. Old prejudices must be got rid of, and no one appreciated more than he did that after the war there must be increase of production. Incidentally, he referred to the report of the Iron and Steel Institute, in which an examination of units of production was made and 2 per man in Germany was compared with 1½ in the United States and one in Great Britain. He had visited America and could say that, given equal facilities, British workmen would "knock spots off" hteir competitors. He referred to the wonderful success which had followed the introduction of conciliation and arbitration boards in the steel and iron trades. The schoolmaster had been abroad for many years, and the press had been a great educative agency. It seemed to be suggested that workmen in this country had a tendency to oppose the introduction of machinery to increase production, but he did not hesitate to say that there had been no machinery introduced into the steel trade that workmen had not done their best to exploit.—Irish Ironmonger.

DODGING THE FOREMAN

A man named Dodgin had recently been appointed foreman in a brickyard, but his name was not known to all the employees. One day while on his round he came across two men sitting in a corner smoking, and stopped near them.

"Who are you?" asked one of them.

"I'm Dodgin, the new foreman," he replied.

"So are we," replied the other workers. "Sit down and have a smoke."

The Importance of Expansion Tanks

Not Sufficient Thought Given to the Expansion Tank in a Hot Water Heating System—Many Heating Engineers Simply Install Them Because Their Father Before Them Did So—Too Often it is Hidden Away Out of Sight

"WELL, do you know, we felt the house get almost unbearably hot, and I went down to see if the furnace was checked, found it was and had no sooner got upstairs before we heard a bang, the house filled with steam and dust and I called for the fire brigade. When all was quietened down I ventured into the cellar and found the furnace all smashed up, the cellar flooded with hot water."

That's the story poured into the ears of the writer a few weeks ago, and the wreck cost somewhere in the neighborhood of $100.00, no lives lost, but a lesson learned. It is a hard thing to say, but the above story just proves that every time a furnace section bursts someone should be held criminally liable. Some one is to blame, and oftener than not that "someone" is the man who installed the system.

Sometimes the heating contractor no doubt follows out his instructions and really knows no better. He may be accustomed to follow plans literally when he should not do so, or he may simply think that so long as there is an open end a few feet above the highest radiator, with a tin tank called an expansion tank, with a water gauge on one side that is sufficient.

No thought is given as to the way it should be connected to the system, or if the occupants of the house do not use the attic, etc., of making provision to safeguard the expansion tank from freezing. Then again this expansion tank is very often connected as shown in Fig. 1, and just left that way.

However, the winter of 1917-18 has been a disastrous one for hot water heating systems, and 9 out of 10 explosions, (and there have been hundreds) have all been caused by the freezing of either the expansion tank, or the pipe going through the roof freezing solid. Or, in a few cases, it has been found that the pipe between one of the radiators and the expansion tank has become frozen, in that way leaving no room for the expansion of the water in the system, and as all heating engineers should consider water incompressible and as even the change of temperature of water from a lower temperature to one a few degrees higher will create a pressure. The heating engineer should also make adequate provision for the expansion of water in a heating system.

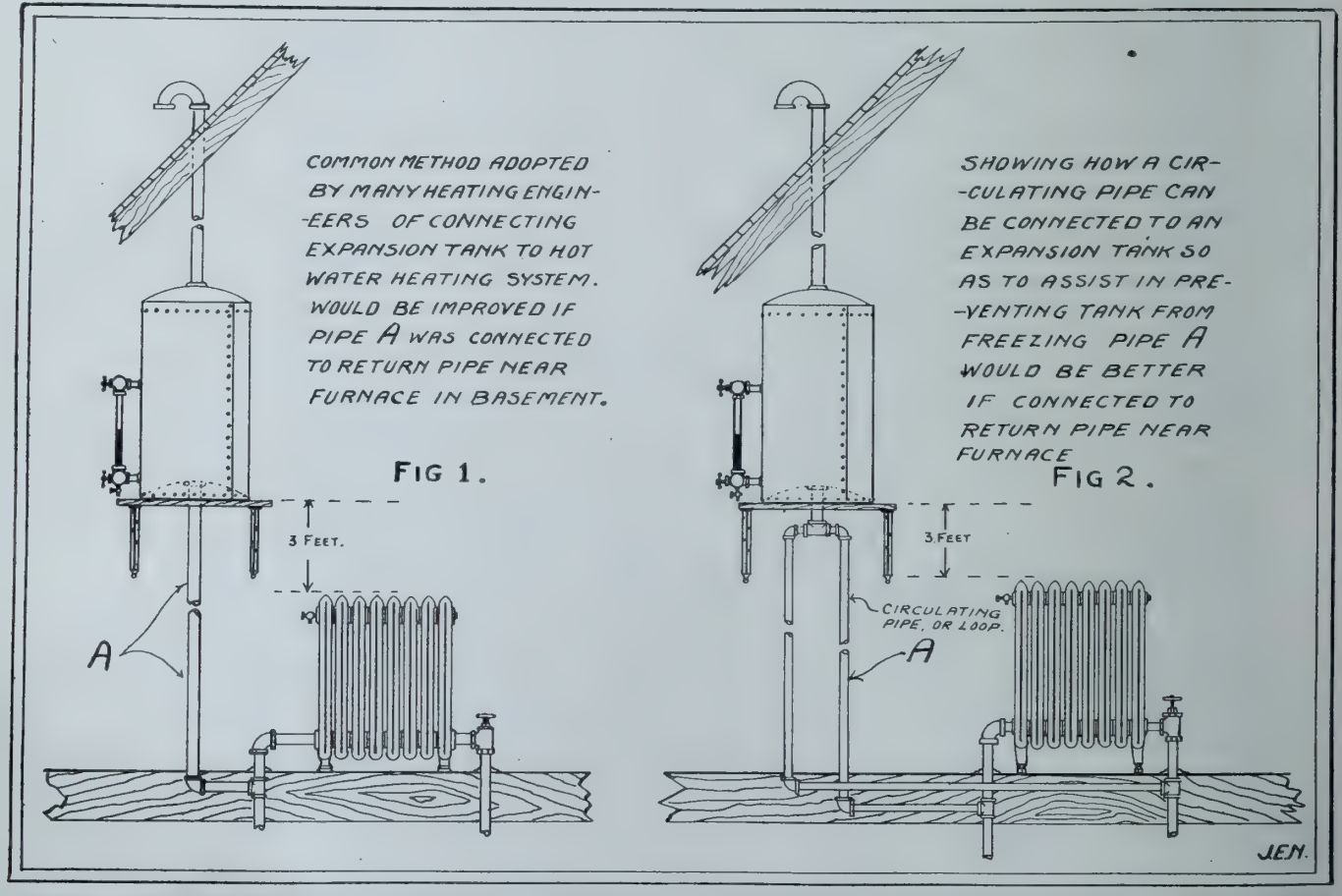
Not only so, but he should also take every precaution to prevent the water in any portion of the system being retarded in its flow or return, its expansion or contraction.

The opening paragraph of this article related to the bursting of the water section next above the fire pot, and the owner of the house had, on account of the fact that some of the upper rooms were not in use, closed them off, and turned the heat off the radiators, in an endeavor to save fuel.

Then the instance where the owner said that "the house was getting very hot, etc." proved that a great pressure was generating, with its relatively high temperature, proving that by placing some controllable resistance on a heating system such as what is known as "booster" or heat generator. A higher temperature is just a very natural occurrence.

Fig. 1 as we stated before, is quite a common method adopted by many heating engineers, mostly for cheapness and also that they have not given the expansion tank and its necessity sufficient importance. No system should be allowed

(Continued on page 28.)



Neither of these expansion tank connections can be endorsed as being ideal. Fig. 1 is altogether wrong. Fig. 2 is a little improved.

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VOL. XII. APRIL 1, 1918 No. 7

THE PROPOSED FEDERAL BANKRUPTCY ACT

A BILL to enact a bankruptcy law in Canada was introduced by S. W. Jacobs, Montreal, when the House opened on Thursday afternoon of March 28. At the present time Mr. Jacobs said, there was no bankruptcy act in the Dominion. In that respect Canada differed from practically every civilized country. The bill proposed to put Canada into line with other countries. The main purpose of the bill, Mr. Jacobs explained, was to see that the debtor could obtain a discharge from his creditors. At the present time there was no distinction whatever made between the honest and dishonest trader in the matter of obtaining a discharge. All were thrown into the discard.

Under the measure, it was proposed that the court should carefully scrutinize the business dealings of traders, separate the sheep from the goats, and when the court was of the opinion that a debtor, through his misfortune, was obliged to assign, he should be given the necessary relief.

The bill was read a first time.

This is a very important bill and should receive the support of every business man in the Dominion as there is no such Dominion law in existence, and what is law in Ontario may not be in accord with the provincial law of any other province.

It is to be hoped that under the new proposed act every person doing business in a general way, i.e., receiving and giving credit, will be required to keep a set of books which will show exactly what his fixed charges or overhead expenditures are; also that when an assignment is made the assignee shall have a greater responsibility than is the case to-day.

Many a man has found himself in temporary difficulties, has assigned, his assets have simply been squandered, and, after a few preferred claims have been paid, along with the assignee's fees, there has been nothing left. A good, well-defined Dominion bankruptcy act will without doubt prove a blessing to both debtor and creditor. It will tend, too, to make better businessmen all round.

PLUNDERING PLUMBERS?

YE gods! but plumbers are robbers. Such is the impression which certain city fathers on the Toronto Board of Education are trying to convey to the public of Toronto.

But what is the real trouble? First, that of all fools in Toronto there are none bigger than those who are on our Board of Education and in the city council chambers, and the writer can prove it if the Toronto newspapers will open their pages to some real outside investigations into the doings of these bodies of men appointed to represent (?) no, I should say "present" the wealth of Toronto to everyone who wants it.

There is going to be over 20 million dollars spent during the fiscal year of 1918 by those "incompetents," and the best they can do is to abuse other people. "Plundering plumbers." If the Toronto plumbers are worth 2 cents they will demand a thorough investigation into the matters that appear to have raised the ire of that brainless member whose first lesson should be to think twice before he speaks once.

What a godsend it would be if the City Council and Board of Education would adopt and carry out that good old motto, "Think twice before you speak once."

The busy man of Toronto has no time to read the reports of the proceedings of the City Council and Board of Control, seventy-five per cent. of whose time is wasted in squabbling and emptiness, and at least thirty per cent. of the money that is raised by taxation is also wasted and why? Because very few practically trained men are on our Board of Education and in the council chambers.

We have no gas by-law. We have a gas company that in spite of the howl against higher rates would be pleased to see restrictions placed on the sale of cheaply gotten-up fixtures, the latter being responsible for a big waste of gas.

SANITARY ENGINEER holds no brief for the Consumers Gas Company, in fact, if anything the very reverse. But we cannot help remembering that Toronto has the cheapest artificial gas in Canada, and a splendid service. If the city fathers would call in a number of practical men to compile a gas by-law, gas consumption per capita would be reduced and thousands of dollars less of junk would be sold. But we are almost afraid to mention another by-law for fear the city architect be saddled with another job which he knows little about.

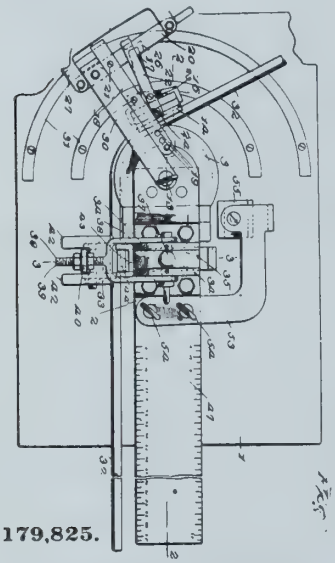
New Canadian Patents

No. 179,825.

John S. Wheeler, Dunsmuir, California, U.S.A., 16th October, 1917; 6 years. Filed 18th May, 1917. Receipt No. 279,881.

Claim.—1. In a bending machine, the combination of a form, a clevis pivoted to the form, a lever extending laterally from the clevis in the plane of the form, a pressure block disposed between and in the same plane with the lever and the form, a saddle carrying the presser block and having an arm loosely engaging the lever, a connection between the saddle and the clevis, and a second clevis secured to the saddle and the presser block and passing around the lever.

2. A bending machine comprising a form, a clevis having a shiftable and pivotal connection with the form, a recessed lever extending laterally from the clevis, a presser device disposed between the lever and the form and having an



179,825.

Pipe Bending Machine.

arm playing in the recesses lever between the ends thereof, and connections between the presser piece and the clevis, said last-mentioned connections being free of the lever.

3. In a machine of the character described, a work holder comprising co-operating jaws, one of such jaws being movable, spaced bearings, an operating lever having an end disc portion inserted between said bearings and provided with hubs, said hubs being mounted rotatably in said bearings, a base piece supporting the movable jaw, an arm rising from the base piece and bearing against the movable jaw and an eccentric connection between said arm and said disc.

4. In a machine of the character described, the combination of a body, an anchor secured to the body, a base piece held to the body by the anchor, a movable jaw slidably mounted on said base piece and co-operating with the base piece and the anchor to hold the work, ar arm pivoted on the base piece and bearing against the outer side of the jaw, and means for operating and locking said arm.

5. In a machine of the character described, the combination of a form, a clevis pivoted to the form, a lever inserted through and secured in the outer end of the clevis, a bracket secured to the lever, a handle fitted to said bracket and a pressure block supported from the clevis and the lever.

No. 179,786.

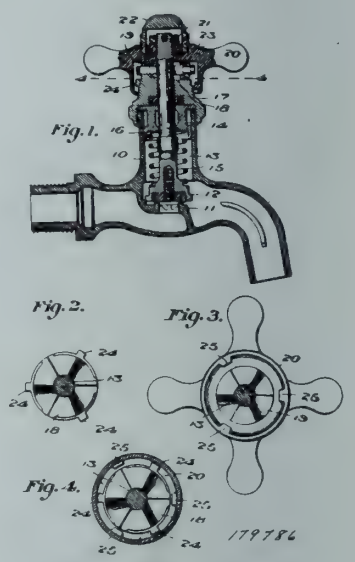
Philip Mueller, Decatur, Illinois, U.S.A., 16th October, 1917; 6 years. Filed 13th August, 1917. Receipt No. 283,197.

Claim.—1. In a self-closing valve, the combination of a body portion having a valve seat, a valve having a stem, means tending to close said valve, an operating handle on said stem having a depending skirt to house the upper part of the valve body and the operating parts between said handle and body portion, means between said handle and body portion to lift said valve and stem when said handle is rotated, stop means on said body portion, and stop means on the skirt of said handle which are brought into registering contact upon rotation and lift of said handle, so as to limit rotation of said handle and lift of said valve.

2. In a self-closing valve, the combination of a body portion having a valve seat, a valve having a stem, means tending to close said valve, an operating handle on said stem having a depending skirt to house the upper part of said body portion and the operating parts between said handle and body portion, means between said handle and body portion to lift said valve and stem when said handle is rotated, stop means on the exterior of said body portion, and stop means on the interior of the skirt of said handle, said stop means being offset vertically, but adapted to be brought into registering contact upon rotation and lift of said handle, so as to limit rotation of said handle and lift of said valve.

3. In a self-closing valve, the combination of a body portion having a valve seat, a valve having a stem, means tending to close said valve, an operating handle on said stem having a depending skirt to house the upper part of said body portion and the operating means between said handle and body portion, means between said handle and body portion to lift said valve and stem when said handle is rotated, radially projecting stop means on the exterior of said body portion, and radially projecting stop means on the interior of the skirt of said handle, the opposed edges of said stop means being adapted to be brought into registering contact when said handle is rotated so as to limit rotation of said handle and lift of said valve.

4. In a self-closing valve, the combination of a body portion having a valve seat, a valve having a stem, means tending to close said valve, an operating handle on said stem having a depending skirt to house the upper part of said body portion and the operating parts between said body portion and handle, means between said handle and body portion to lift said valve and stem when the handle is rotated, stops integral with and projecting radially from the exterior of said body portion and disposed equidistant thereabout, and stops integral with and projecting radially of the interior of the skirt of the handle and being angularly spaced thereabout to correspond to the stops on said body portion, the stops



No. 179,786. Cock.

on said body portion being vertically offset from the stops on said handle, but being in such relation thereto that upon rotation and lift of the handle they will be brought into registering contact so as to limit rotation of said handle and lift of the valve.

The dominie was told by his family doctor that a glass of toddy would do him no harm. "I canna manage it," said the minister, "my housekeeper wad gossip among the church women."

"Oh, keep it in your private cupboard, and when you get your shaving water in the morning, get a little extra supply."

A month later one of the female parishioners who was calling on the housekeeper enquired as to the dominie's health.

"I'm sair afraid the meenister is losing his mind," was the answer.

"My goodness, how is that?" said the visitor.

"Weel, he asks for shaving water five or sax times a day."

Market Conditions and Tendencies

Statements Regarding the Prices and Trend of Supplies.

THE MARKETS AT A GLANCE

FURTHER advances in the price of solder and babbitt metals are somewhat of a gauge as to the strength of tin. Locally, supplies of tin are reported scarce, in fact are almost unobtainable. Little hope of shipments reaching the market before another month or six weeks elapses is held out. Ingot tin is holding around $1.00 per pound.

Featuring markets otherwise somewhat dull is the decline of 25c per 100 pounds registered in some quarters in galvanized sheets. Receipts of stocks which have been in transit for weeks and months are reported, keener competition has developed and a decline has followed.

The restrictions placed around the metal market have been in operation long enough to have a combined effect on the Canadian market. Stocks are being reduced and not replaced in accordance. Whether this will result in higher prices is still a question but there is a feeling that this result may follow.

A fair movement of wrought iron pipe is reported, rush orders being submitted indicating that stocks throughout the country are at a pretty low point. Improvement in the demand for practically all plumbing lines continues to be shown and the coming month is expected to show better results in this respect. Soil pipe and fittings, cast iron and malleable pipe fittings, enamelware, valves, and range boilers held unchanged in price.

TORONTO, March 28.—The markets have maintained a fairly level basis during the past couple of weeks. A decline in the price of galvanized sheets has been made, whereas, solder has undergone revision upwards. Outside of these two lines, prices show practically no change, soil pipe and fittings, cast iron and malleable iron fittings, wrought iron pipe and valves holding steady and unchanged. A slight improvement in business is reported and April is expected to show further developments along this line.

Range Boilers Register No Change

RANGE BOILERS.—Little change is evident in the situation as regards range boilers. Improvement in receipt of sheets is expected to gradually overcome the shortage in some sizes but as yet conditions show little variation from report in the last issue. Prices remain firmly established at figures given herewith.

	Standard	Extra Heavy
30-gallon range boilers	$14.00	$17.00
35-gallon	17.00	20.50
40-gallon	20.50	24.00
52-gallon	28.00	32.00
66-gallon	37.00	42.00
82-gallon	45.00	50.00
100-gallon	62.00	70.00

No Developments In Enamelware Situation

ENAMELWARE.—There have been no developments of an exciting nature in enamelware. Business, though showing some slight activity is not in large volume but is about as heavy as was expected. That the coming month may see an increase is confidently expected but restricted building operations will naturally hold this line down to a comparatively small range.

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Sinks, roll rim, 18 x 30 in., staple	16 80
Closets, oak tank and seat	22 00
Do., enamel iron or white vitro tank	23 75

Firm Tone Upheld In Soil Pipe And Fittings

SOIL PIPE, FITTINGS.—A firm tone is evident in prices quoted on soil pipe and fittings though no change over quotations appearing in last issue is noted in discounts given below. Cast iron and malleable pipe fittings are enjoying a fairly good demand and prices show no change. Quotations prevailing to-day on the above lines are given herewith:

SOIL PIPE FITTINGS.

Medium and extra heavy soil pipe, 6-inch and under	35%	2½%
8-inch soil pipe		30%
Medium and extra heavy fittings, and under	40%	2½%

C. I. PIPE FITTINGS.

Cast iron fittings		15%
Cast elbows, tees, etc.		15%
Plugs	25%	
Bushings	30%	33%
Flange unions, standard		20%
Dart unions, ¼-inch to 2-inch	20%	25%
Do., 4½ in. and larger		15%
Nipples, up to 4-inch		45%
Do., 4½-inch and larger		40%
Do., running thread 4-in. and under		25%
Couplings, 4-in. and under		35%
Do., 4½ in. and larger		15%

MALLEABLE FITTINGS.

	Black	Galv.
Malleable Fittings, Class A, lb.	0 50	0 63
Do., Class B, lb. net	0 22	0 33
Do., Class C, lb. net	0 15	0 22

Waste Moving Freely; Oakum All Sold

WASTE, OAKUM.—Capacity production is being maintained by manufacturers of waste, and a big movement is reported. Some improvement in commercial demands is apparent. In some quarters it is intimated that prices may undergo revision upward in another month or six weeks. However, another view expressed was that with more cotton now being used, more waste is available and heavy stocks usually have a tendency toward weakening the market. From this it may be gathered that uncertainty as regards the future trend of prices exists. Prices on white wiping waste now range from 16 to 21c per pound, and colored wiping from 12 to 16½c.

Oakum in some quarters was said to hold little immediate interest. This was due to the fact that available stocks were all sold. There is little to note in the situation at present and prices remain unchanged as follows:

		Per 100 lbs.
Best American		$21.50
U.S. Navy unspun		20.75
Plumbers' spun	$8.50	10.00

Valves Show No Disposition To Change

VALVES.—The situation in respect to valves remains unchanged. Business continues good and prices have been upheld at quotations prevailing at last issue and shown below. No immediate change is anticipated in these lines.

	Discount off list
Ground work	50
Compression work, standard	52
High grade	45
Cushion work	46
Fuller work, standard	50
High grade	43
Basin cocks, No. 0 standard	46
Nos. 1 and 2	46
Bath cocks	53
Flatway stop and waste cocks, standard.	53
High grade	50
Roundway stop and waste cocks, standard	53
High grade	50
Brass steam cocks, standard	Net
Globe, angle and check valves, standard.	10
Do., removable seat	7½
Radiator valves, standard	15
Do., removable seat	10
Patent quick opening valves	35
Basin Cocks—	
No. 0 and 1, Fuller pattern	50
No. 0 and 1, compression	46
Midget	50
Globe, angle and check valves, medium pressure	30
Radiator valves, standard	30
Radiator valves, Jenkins disc	30
Radiator valves, quick opening	40

WROUGHT IRON PIPE

Effective Feb. 26, 1918

Standard Buttweld—	Per 100 feet Black	Galvanized
⅛ in.	$ 6 00	$ 8 00
¼ in.	5 16	7 29
⅜ in.	5 16	7 29
½ in.	6 55	8 12
¾ in.	8 28	10 41
1 in.	12 24	15 39
1¼ in.	16 56	20 82
1½ in.	19 80	24 89
2 in.	26 64	33 49
2½ in.	42 71	53 53
3 in.	55 85	70 00
3½ in.	70 84	87 76
4 in.	83 93	104 10
Standard Lapweld—		
2 in.	29 60	36 08
2½ in.	44 46	54 70
3 in.	58 14	71 53
3½ in.	72 68	90 62
4 in.	86 11	107 37
4½ in.	97 79	122 56
5 in.	114 00	142 82
6 in.	147 80	185 28
7 in.	192 80	241 57
8 L in.	202 50	253 75
8 in.	233 30	292 32
9 in.	279 50	350 18
10 L in.	259 20	324 80
10 in.	333 70	418 18

Terms 2% 30 days, approved credit.
Prices—Ontario, Quebec and Maritime Provinces.

Wrought Iron Pipe Moving; Unchanged

WROUGHT PIPE.—A fair movement in wrought iron pipe is developing but orders are as yet not heavy. Indications are that stocks throughout the country are at a low level as orders coming to hand are labeled "rush." Under existing conditions this is not always possible. Stocks in the city are none too plentiful and manufacturers indicate that raw materials are very hard to get. Supplies are equal to present demands but a big volume of business would soon deplete available stocks. Prices given herewith show no change.

Boiler Tubes Excite Little Interest

BOILER TUBES.—Present stocks of boiler tubes are at a very low ebb, but the demand is of course limited. Shipments are not expected prior to the month of May and at that time it is thought there will be ample arrive to carry along an improved trade. Prices are not expected to show any great variation. Present quotations are:

Toronto—	Per 100 feet Cold drawn	Lapweld
1 inch	$36 00	$ ....
1¼ inch	40 00	....
1½ inch	43 00	36 00
1¾ inch	43 00	36 00
2 inch	50 00	36 00
2¼ inch	53 00	38 50
2½ inch	55 00	42 00
3 inch	64 00	50 00
3¼ inch	....	58 00
3½ inch	77 00	60 00
4 inch	90 00	75 00

Galvanized Sheets Decline 25 Cents

SHEETS, PLATES.—A decline has occurred in galvanized sheets since last issue of 25c per 100 pounds. Increased receipts of sheets are reported arriving and keener competition for business is developing with the improvement in stocks evident. Prices on 10¾-oz. galvanized sheets now range from $9 and $9.25 to $10.50 per 100 pounds. This is one commodity on which this condition usually prevails. The demand shows signs of improvement and as spring opens up more the movement is expected to assume very good proportions. Black sheets remain unchanged. Stocks of lighter gauges are good but a shortage in supplies of the heavier is reported. The demand is seasonable. Prices are given below:

BLACK SHEETS—	Per 100 lbs.		
10 gauge	$	$12 00	....
12 gauge	7 55	10 10	....
14 gauge	7 45	8 40	....
16 gauge	7 30	8 50	....
18-20 gauge	7 30	8 05	....
22-24 gauge	7 35	8 10	....
26 gauge	7 40	8 15	....
28 gauge	7 50	8 25	....
3-16-inch plate	10 25	....	....
¼-inch boiler plate	10 00	....	....
GALVANIZED SHEETS—			
10¾ oz.	$ 9 00	$9 25	$10 50
U.S. 28	8 90	8 95	10 20
U.S. 26	8 40	8 65	9 90
22 and 24	8 25	8 50	9 75
18 and 20	8 10	8 35	9 60
16	7 95	8 20	9 45
14	7 85	8 10	9 35

Solder Up Another 2c; Babbitt Metals Advance

LEAD AND ZINC PRODUCTS.—Featuring an otherwise quiet market, solder has again climbed in price 2c per pound, bringing quotations to a new high level. The low prices shown below are quantity prices, and ordinary shipments would range from 2c per pound higher to the higher prices shown. Tin is very scarce and even at present high prices practically unobtainable. No relief from the present shortage is expected to develop for a month or six weeks. Business is reported excellent. Stocks are in good shape and orders are being taken care of promptly. Apart from its effect on solder this condition in tin has had a strengthening influence on babbitt metals, the higher grades now being quoted as high as 95c per pound. The range now runs from 14c to 95c per pound. No change in lead pipe, traps or bends or sheets has been made. Business on these is practically at a standstill though with the opening up of spring some improvement is expected. Present prices on all lines follow:

Lead pipe, lb.	$ 0 14	$ ....
Lead waste pipe, lb.	0 15	....
Lead traps and bends	Net list	
Lead wool, lb.	0 16	
Lead sheets, 3 to 3½ lbs. sq. ft., lb.	0 13¼	
Lead sheets, 4 to 8 lbs. sq. ft.	0 12½	
Cut sheets, ¾c lb. extra, and cut sheets to size, 1c lb. extra.		
Solder, guaranteed, lb.	0 54¾	0 55
Solder, strictly, lb.	0 46¾	0 50
Solder, commercial, lb.	0 42¼	0 50
Solder, wiping, lb.	0 40¾	0 45¼
Solder, wire, lb.	0 50½	0 58½
Zinc sheets, per lb.	0 26	....

Iron Prices Unsettled; Little Movement

OLD MATERIALS.—All prices on scrap iron are unsettled and there is a possibility that slightly lower quotations may prevail. The prices shown below are correct to last sales made but little activity has been apparent during the past week or ten days, and little interest is expected to develop for a further short period. Licenses to export are being granted by the government in many lines and business shows little real disturbance. What may develop is somewhat hard to determine and only time will reveal the certainty in the future. Changes of a sensational character are not expected, however, either up or down and the general feeling is that little variation will manifest itself. Prices remain unchanged on the following basis:

Tea lead	$ 0 04½	....
Heavy lead pipe	0 07	0 07½
Yellow brass	0 12	0 13
Red brass	....	0 21
Light brass	....	0 09½
Heavy zinc	0 06	0 06½
Heavy copper	0 22	0 22½
Stove plate, per ton	17 00	18 00
Old cast iron, per ton	25 00	26 00

Restrictions Felt In Ingot Metals; No Change

INGOT METALS.—The metal market is feeling the effect of the many restrictions that have been placed around it. These have been in operation long enough to have a combined effect on the Canadian market. Stocks in Canadian shops are gradually being reduced and not being replaced in accordance. Tin is scarce and practically unobtainable, while little interest centres around the other metals.

COPPER.—There are few outstanding features in connection with copper trading. Although June 1 is some weeks away yet, the tendency is to watch and see what will happen on that date when the United States' price agreement expires. The United States has done a very large export business and, apparently at the suggestion of the Allies, is purchasing all available copper. As no figures are given out it is impossible to gauge the volume of trade. No change in the price of 30c to 32c per pound is reported locally.

TIN.—The outstanding feature of the tin market is that it is scarce and hard to get. Canadian dealers find it hard to get much of it past United States officials. Deliveries are not improving and it is said that the market must look to Chinese product for supplies. The amount in trade is small though some stocks are still held locally. The quotations locally remain unchanged at from 95c to $1 per pound. The primary market remains very firm.

SPELTER.—Spelter is quoted here at 9¾ to 10c per pound, showing no price change. Small quantities of cheaper spelter are finding their way to the New York markets, but these are not sufficient to change values, and cannot be accepted as reliable indications of real values.

LEAD.—Little change is apparent during the week. Prices remain unchanged locally at 9½c to 10c per pound. The primary market is extremely dull. Difficulty in transportation is still apparent.

ANTIMONY.—Demand continues very light and the market attracts little attention. Quotations locally range from 16½c to 18c per pound.

ALUMINUM.—No change in the price

(Continued on page 30.)



TRADE GOSSIP

Carter & Byrne, sanitary engineers, St. John, N.B., have dissolved partnership.

D. M. Poirer & Co., sanitary engineers, Waterloo, Que., have sold to Charles Paquette.

Alex Brown, sanitary engineer, hardware, etc., Harriston, Ont., has suffered fire loss.

CONTRACTS AWARDED

Oakbank, Man.—A. D. Christie, 521 Henry Ave., Winnipeg, has heating contract for $12,000 railway station for Canadian Pacific Railway.

Mount Royal, Que.—E. W. Barnes, 850 Durocher St., Montreal, will carry out heating contract for six residences, costing $50,000, for Canadian Northern Montreal Land Co.

St. Louis de Courville, Que.—Brousseau & Frere, 320 St. Paul St., Quebec, have heating contract in connection with the erection of a church for the parish.

Halifax, N.S.—Farquhar Bros., Barrington St., have plumbing and heating contract for military huts costing $250,000 for the Department of Public Works, Dominion Government.

Elma Township, Ont.—James Nicholson has general contract for drainage work, including three culverts, costing $7,000, for the township council.

Brantford, Ont.—Hamilton & Toronto Sewer Pipe Co., Ltd., Hamilton, have contract for yearly supply of sewer pipe for the City Council.

Hamilton, Ont.—Gartshore, Thomson Pipe & Foundry Co., Hamilton, have cast iron pipe and special contract for yearly supply for City Council.

WORKS AUTHORIZED

Moncton, N.B.—Tenders are being called for plumbing and heating work in connection with erection of $150,000 hotel for Brunswick Hotel, Ltd.

Chicoutimi Parish, Que.—Tenders are to be called shortly for waterworks system by the municipal council. Cost, $15,000.

Province of Ontario—The Department of Public Works, Provincial Government, has included $21,000 in the 1918 supplementary estimates for provincial drainage work.

Raleigh Township, Ont.—Council intends to instal and repair a number of drains.

St. John, N.B.—New pipe line to Vancouver, B.C.—The Vancouver and District Joint Sewerage and Drainage Board has appropriated $115,236 for its work in 1918.

Spruce Lake will be laid this year and the operations at Lake Fitzgerald and on the Manawagonish Road extension will be proceeded with.

NEW REPRESENTATIVE APPOINTED

The Dominion Radiator Co., Ltd. of Toronto have appointed a new representative for the Ottawa Valley & Ottawa city district, in the person A. W. Allen, Ottawa.



A. W. ALLEN.

Mr. Allen has several times contributed interesting letters to the SANITARY ENGINEER particularly in reference to the cast iron versus wrought iron pipe for soil, waste and drainage purposes. He is also an enthusiastic teacher, and is instructor of the sanitary and heating classes being conducted at the normal school, Ottawa. Mr. Allen has graduated from the bench and is a student of no mean order, and, from all accounts is proving a very able instructor.

We hope to receive an article once in a while from his able pen, and we beg to join his many friends in wishing him every success in this his new field of labor.

WORKS CONTEMPLATED

York Township, Ont.—Township Council contemplate laying sewers on a number of streets in this district.

Todmorden, Ont.—Ratepayers' Association contemplates installation of waterworks system costing $5,000 in the Torrens School.

Chinook, Alta.—Town Council contemplates construction of new water supply system.

Grand Mere, Que.—Town Council contemplates alterations to aqueduct system.

CONSTRUCTION

Brockville, Ont.—Canada Carriage Factories, Ltd., contemplates additions to Briscoe motor factory in the near future.

Calgary, Alta.—Great War Veterans' Association contemplates erecting a memorial auditorium to accommodate 2,000 or more people.

Calgary, Alta.—The Rolling Mill Company is building a storage warehouse and intends installing additional machinery in the plant.

Quebec, Que.—City Council contemplate the erection of a $35,000 hospital.

Saints Anges, Que.—Lorenzo Auger, 39 St. John St., Quebec, is preparing plans for a $25,000 artificial stone sacristy for the congregation.

Saints Anges, Que.—Lorenzo Auger, 39 St. John St., Quebec, is preparing plans for a $12,000 two-storey artificial stone presbytery and a $50,000 church for the congregation.

St. Cyprien, Que.—Tenders are expected to be called for the erection of a $50,000 church for the parish.

Pembroke, Ont.—Merchants Bank of Canada, head office, Montreal, have secured a site for the erection of a $25,000 brick bank building.

Lethbridge, Alta.—City Council contemplates the erection of a Carnegie library to cost $30,000.

Lauzon, Que.—Parish of St. Joseph de Levis contemplates the erection of a $100,000 church or large extensions to present building.

Windsor, Ont.—Universal Button Company, Walker Road, Walkerville, contemplate the erection of a $15,000 factory.

Listowel, Ont.—Perfect Knit Mills, Ltd., Wallace St., are having plans prepared for a $7,000 reinforced concrete dye factory.

London, Ont.—Tenders are being called by the architects, Watt & Blackwell,

Bank of Toronto Building, for the erection of a $50,000 office building for the Huron & Erie Company, Richmond St.

Halifax, N.S.—Plans for offices and headquarters, costing $165,000 for the Great War Veterans' Association, Barrington St., are being prepared by Booker & McKechnie, Davidson Building.

Lower East Pubnico, N.S.—Tenders will be received by the architects, R. A. Frechette, 30 Bonaccord St., Moncton, for the erection of a $15,000 one-storey frame church for the Roman Catholic congregation.

Montreal, Que.—Notre Dame Hospital contemplate the erection of a hospital at Lafontaine Park, at a cost of $1,000,000.

TAKES OVER OLD ESTABLISHED BUSINESS

It was with no small amount of surprise to SANITARY ENGINEER that we learned that Joe Devereux had acquired that old established manufacturers' agency business the T. C. Collins & Son, of Beaver Hall Square, Montreal. Joe is, as most every member of craft at least in the maritime province knows, the chief of the J. R. Devereux Co. whose premises were until recently, at 233 St. James Street.

The T. C. Collins & Sons concern was for many years the eastern branch of the Standard Sanitary Manufacturing Co., Ltd., and from now on this concern will be represented by the J. R. Devereux Co., the latter having taken over the entire interest of T. C. Collins & Sons.

We cannot refrain from looking back to the days when "Joe" was thought to be somewhat of a "dreamer" but he has made good, and we wish him well.

Joe is said to be somewhat of a "bachelor recluse" in private life, but such is not the case. The writer has been entertained many times at his rooms in the Y. M. and listened to his plans, his aspirations, and has had a "peep behind the scenes." Joe was a good son to his mother, is a good brother, and is also a good "big brother." He has one of the finest private collections of gramophone records in Canada and entertains many a lad who would otherwise have gotten into questionable company. So we cannot help remarking that with such a spirit of good sonship and brotherhood in his make up, Joe's business efforts are bound to bring him success.

SUCCESSFUL UNION AMONG HALIFAX SANITARY AND HEATING ENGINEERS

A recent mass meeting of plumbers and steam fitters of Halifax held recently in the Board of Trade rooms was largely attended, and at the conclusion, a number of new names were added to the membership roll.

General Organizer Bruce, of Toronto, who came to aid in smoothing out the labor difficulties which existed here, was the main speaker of the evening. He referred to general industry conditions and the success of co-operated effort in maintaining stability in the industrial field for preservation of democracy. There were addresses also by Mr. J. Cote, of Montreal, and President Bremner of the Halifax local. Among those present were two naval men who were members of the plumbers' organization in England.

PLUMBING BY-LAW UNCHANGED

Fort William, Ont.—Rumors to the effect that there was a movement on foot to repeal the plumbing by-law brought a storm of protest upon the City Council at a recent meeting when a letter from twelve master plumbers was backed up by a delegation, including one journeyman, with a lengthy petition, which set forth that it was understood that there was a motion to mutilate or repeal the by-law, and that the protest was lodged on account of this not being a matter merely local in scope, but the result of years of experience by medical men and sanitary engineers all over the world. It is designed to protect public health, and examination is such that any plumber who is fit to be a journeyman can pass it. The by-law is no novelty and Toronto has just raised the license fee from one to ten dollars. This petition was presented by P. S. Burton and spoken to at length by G. Miller.

HAMILTON PLUMBERS TO ARBITRATE

Hamilton journeymen plumbers and master plumbers held a conference recently relative to the former's demand for an hourly wage increase from 47½ to 56¼c and agreed to submit the question to a Board of Arbitration. The employers offered the men 50 cents an hour. The men's committee refused this, pointing out that already the men were receiving this rate as an inducement to keep them from leaving the city.

There are some amongst the twenty-six employers who were willing to meet the demands of the men at a later meeting, but they were overruled by those who maintained that the advance to 56¼ cents per hour over the present scale of 47½ cents was altogether out of proportion to the alleged advance in the cost of living. Norman Clark, Walter Britton and Fred Staunton were chosen the representatives of the employers in the coming arbitration, while Ald. O'Heir, Ralph Bowes and Harry Fisher will represent the union. There are about 100 men and 26 shops affected.

The men are working under a contract of three years' duration, which was entered into only last year, but they believe that conditions warrant a new arrangement now. Work has been very plentiful, wages, with overtime, running high.

MONTREAL NEWS NOTES

Joe Laurier Under the Weather

Joseph Laurier, Provincial Vice-president of the Canadian Society of Domestic Sanitary and Heating Engineers has been ill and confined to the hospital for the past two or three months. Mr. Laurier is also vice-president of the Montreal Master Plumbers' Association. At a recent meeting of the first-mentioned society a resolution of sympathy was passed and conveyed to Mr. Laurier, with expressed hope for his speedy recovery.

Consolidated Rubber Co. Gets a Good Man

H. Clarke, who has been in the employ of John Watson and Co. for some time, has accepted a position as foreman of the steamfitters employed by the Canadian Consolidated Rubber Co. and undertook his new duties on the 25th March.

Just Completed Big Job

Charette and Frere, plumbers and steamfitters, Montreal, have just completed the heating and plumbing in the Roman Catholic Church Presbytery at St. Francis de Sales. They also had the contract for the furnishing and equipping of the electrical plant and system throughout. A central heating plant supplies the required heat to both church and presbytery, and this is a hot water system, located in the church basement.

TRADE NOTES.

Carter & Byrne, plumbing and heating, St. John, N.B., have dissolved partnership, Carter continuing the business.

WINNIPEG PLUMBING DIVISION

Permits issued

71

Inspections

Water Tests	Smoke Tests	Subsequent Inspections	Miscellaneous Inspections	Defects Rectified
23	54	277	20	126

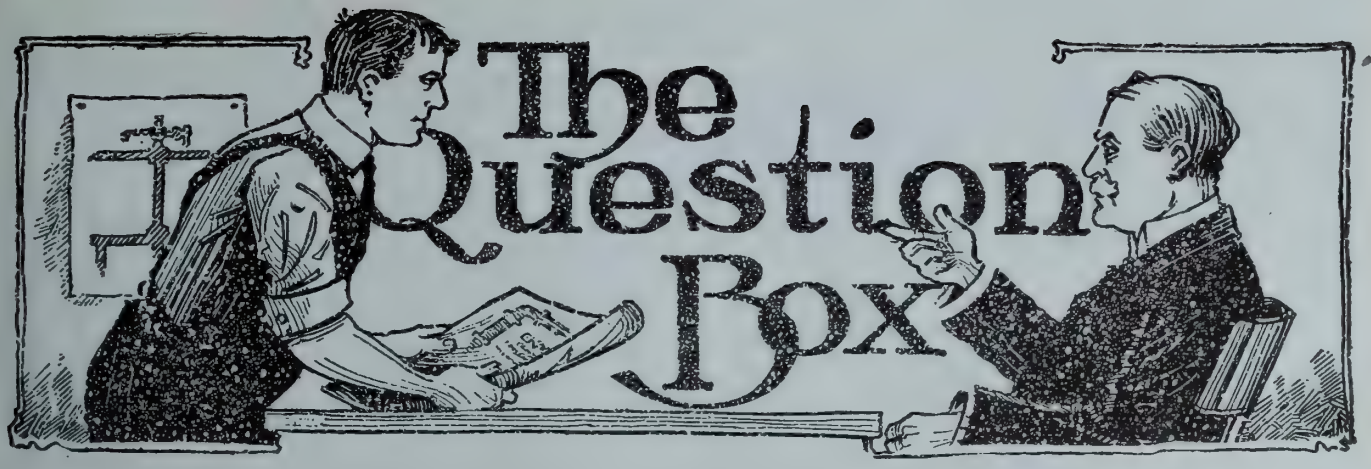
Sewer Division

Permits issued	Connections constructed	Inspections
1	3	51

Sewer Flushing

Tank Flushings Gallons	Hose Flushings Gallons	Total Gallons of Water
1,271,296	816,875	2,088,171

The above table shows the work accomplished by the Winnipeg Plumbing and Sewer Inspection Department during the month of February—a public service that cannot but be of inestimable value to the citizens of Winnipeg.



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

SEPTIC TANK QUERIES

Editor Sanitary Engineer:—

The questions and answers which appeared in your last issue of SANITARY ENGINEER in connection with septic tank construction prompt me to ask you for advice regarding a septic tank which I expect to have to instal for a country school.

There is lots of room for the subsurface field tile bed, but I am told that a 5-inch syphon will be needed. I understand that a 5-inch syphon discharges at about 18-inches, which will mean that the tank will need to be much deeper. I want to keep this depth down as much as possible, would it be possible to use two smaller syphons, say two 3-inch ones?

Further, I do not want to have the breather project up through the ground, because of the fact that it will be in the way of the pupils of the school during recess hours. Could you suggest how this can be overcome?

I. S. E., Manitoba.

Fig. 1 shows how two syphons can be connected together so as to operate at one time. The chief point to take care of is, that the two bells be perfectly level and in line with each other and that the joints be absolutely tight. If they are not level compression will be greater in one bell than the other, and if the threaded joints and union is not tight the air will leak out and there will be an imperfect operation of the syphon. In fact there is a danger of the syphons not acting at all.

Regarding the breather. It can be taken off on the inside the pipe carried as near the top as possible to prevent any chance of the fluid overflowing through it in case the syhpon did not operate. This syphon is shown with a pipe taken off the top of the bend which means that a special syphon would have to be procured. But the same results can be obtained by using a T. or T. Y. If the syphon outlet is 4 inches, which would be the case with a 3-inch syphon, a 4 x 2 T. or T. Y. could be used, and the syphon set more towards the centre of the dosing chamber.—Editor.

READ THIS AND PONDER

Mr. Editor—I was called into a place a few days ago to put in a new furnace grate into a small sectional steam boiler. The accompanying sketch will give you an idea of what I found: A square sectional steam furnace of a good type; the building had been enlarged about four years ago; and so as to heat the building with the same boiler the owner, who by the way is a handy man, concluded that if he carried more steam pressure that the additional rooms could be heated without increasing the size of the furnace.

Quite a logical conclusion, of course. Had the fire not been out I would not have stayed in that building any longer than it would have taken me to get out.

You will please note that a 56-lb. weight is shown on the top of the safety valve, and such a safety valve should never have been used in any case.

I am pleased to know that on new furnaces a more improved safety valve is necessary now.

However, I learned that to heat the additional rooms the owner kept adding weights to the "safety valve" (?) until it ceased to leak, and finally getting tired of adding small weights, he tried the 56-lb. weight. This would not stand on the round ball, so he took the ball off and had a flat surface ground on the top.

When I examined the pressure gauge I found that the gauge cock was closed, and upon asking why it was closed, was informed that the gauge began to leak, so to prevent the leak the cock was closed.

Now, Mr. Editor, what do you think should be done to prevent such a danger-

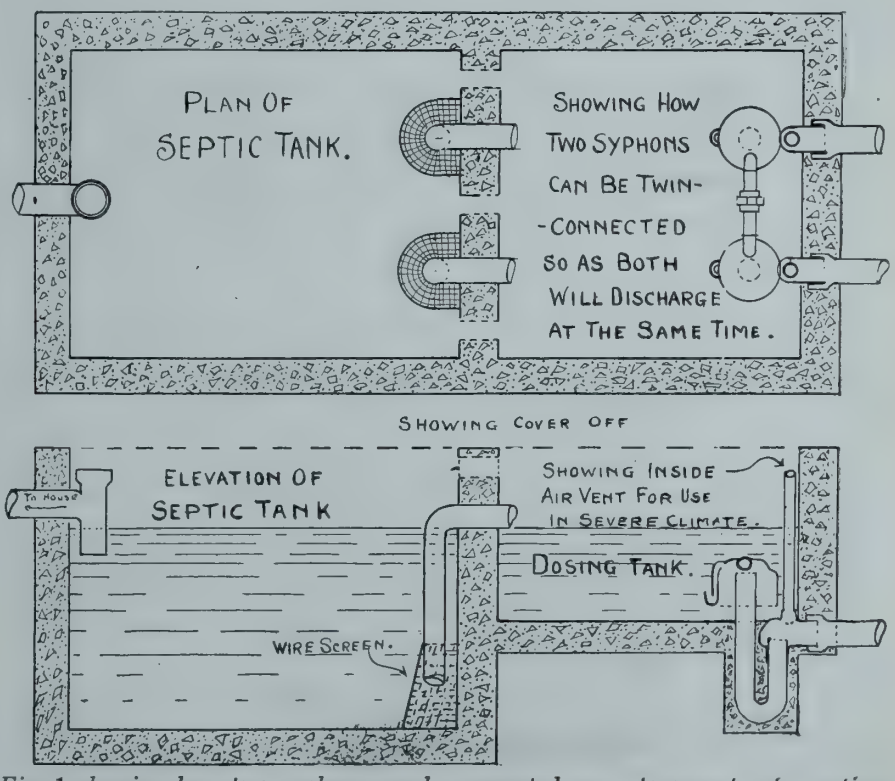


Fig. 1 showing how two syphons can be connected so as to operate at one time, with inside breather.

ous situation? I am not, I must confess, quite as religious a person as I should be, but such a state of affairs makes me feel somehow that we have over us a most merciful Providence, or there would be more calamities than there are.

I think the above case is of sufficient importance to warrant being published, and from now on if you think it is I am going to send you more cases of almost a similar nature.

A HEATING ENGINEER,
TORONTO.

The above, while more in the nature of a communication, has one question of importance, viz., the paragraph which asks the editor what should be done to prevent such dangerous conditions arising.

The only way to "prevent" is to have all heating systems inspected every year. A regular card index should be kept by a regular qualified boiler inspection department showing the condition and lay-out of every system or portion thereof that has a direct bearing upon the safety of the apparatus.

If this annual inspection were put into force, any work that had been executed, additions or alterations, that were of the nature referred to, would be found out and possibly lives saved.

In this case, too, the owner was wasting an awful lot of fuel. It is a well known fact that when steam is generated specially for heating purposes it is most economical to generate only low pressure, and, of course, in this particular case a low pressure installation would have meant a larger boiler; but the extra cost would soon have been liquidated, and the whole system become an asset instead of a liability, as well as being a very dangerous apparatus, making the whole building in which it was situated nothing more than a death trap.

The SANITARY ENGINEER has repeatedly given publicity to this matter of annual inspection of all boilers, whether power or heating plants.—

IT'S THE KNOWING HOW

"I left England a political slave; I shall return to it a free woman," remarked Mrs. Pankhurst recently at a meeting of Russian suffragists. "But," she continued gravely "it is not the possession of the vote that counts, it is knowing how to use it." And in order to illustrate her contention she proceeded to tell the story of the pedestrian who had nearly been run over by a taxi. "You don't know how to drive," cried the angry man, as he brushed the mud from his clothes. "Don't I?" cried the no less infuriated driver. "Here's my driver's certificate." "I don't believe it's yours," was the retort. "Not mine!" gasped the indignant driver. "Why, I bought it from a pal who's gone into the army, and paid him for it." The above reminds us of the curbstone plumber who puts up his shingle and claims to be a practical man when as a matter of fact, the only part of his make up where "practical" comes in is on the shingle.

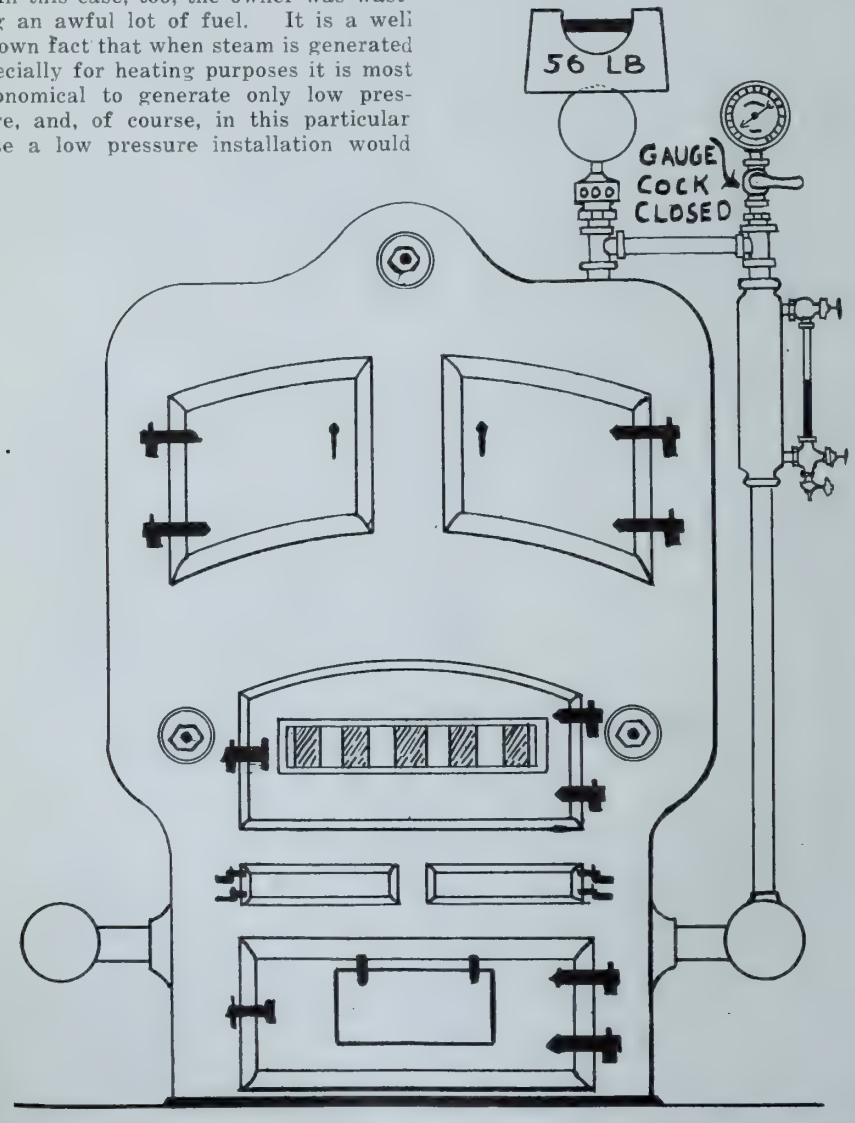


Fig. 2.—Showing how a handy man overcame the need of installing a large furnace.

THE IMPORTANCE OF EXPANSION TANKS

(Continued from page 18.)

to exist under any circumstances that is fitted up as is Fig. 1, because of the fact that so many things may happen that would cause the furnace to burst. The supply valve which furnishes water to the system not being fitted to the expansion tank would likely be connected at some point on the return at the furnace, and the person operating the system may turn on the water, allowing too much to enter the system, thus filling the tank too high up and with the water becoming heated a still higher point is reached on account of the water expanding, then as there is no overflow pipe fitted to the system, except the one which is projecting through the roof and when there is too much water in the tank this pipe will very often be filled with water and freeze, such an occurrence has often resulted in the bursting of the expansion tank by expansion and generating of too high a pressure.

On the other hand, this pipe through the roof has become frozen just when the water has been at the greatest expansive point, and, a change in temperature by, say, the fire in the furnace getting low, has caused the expansion tank to collapse because of the water contracting, and there being no free opening, a vacuum has been set up, which the tank could not of course resist.

In the old days, a small vacuum valve used to be fitted to many of the hot water as well as steam heating systems, mostly the latter. But the writer many times made a small spring valve that would blow at above 25 lbs. the valve had also a small vacuum valve inserted in the centre of the spindle of the spring.

Some of the members of the old guard will recall the time when all such little contrivances were made up by the "fitter."

Fig. 2 is another method which can be adopted to advantage, in a system that is already installed in a similar way as is shown in Fig. 1. This method is suggested as an easy way to prevent the expansion tank from freezing, and also without incurring any great additional expense, but in all such cases the occupants of the house should be made conversant with the whole working of the system. They should be told what the expansion tank is for, and the high water mark in the water gauge should be given. Better still a notice should be placed on the tank stating what height the water should be when the furnace is not in operation.

(Continued in next issue)



MUELLER

Self-Closing Basin Cocks

WHEN you complete the installation of MUELLER Self-Closing Basin Cocks you know you have given your customers the maximum of service.

A phosphor bronze spring of permanent elasticity is the actuating factor, and requires but little more effort to operate than the ordinary compression cocks. The tension of the spring will close against 175 lbs. of water pressure, and the MUELLER patented roller bearing eliminates friction and assures operating satisfaction and lifetime wear.

A malleable iron-locking washer is furnished with MUELLER Basin Cocks. It locks the Cocks immovably to basins of any thickness at any angle desired.

The MUELLER formula of red brass and careful attention to coring, machining and finishing guarantees the superiority of MUELLER quality.

H. Mueller Mfg. Co., Limited

SARNIA, CANADA

MUELLER

NOW HAS PLUMBING EXPERT

The town of Dartmouth, N.S., now has a plumbing inspector, Mr. W. N. Forbes having been appointed by the Town Council at a salary of $600 per annum. The establishment of plumbing laws similar to those in effect in Halifax is soon expected. Mr. Forbes offered his services two months ago as plumbing inspector as a tryout, and since that time he has shown the advantages of a plumbing inspector, with the result that he has been permanently appointed. His appointment is to date from January first.

THE A. B. C. OF SANITARY HOUSE DRAINAGE

A very attractively gotten up 20 page booklet bearing the above title has just been placed at the disposal of the trade by Dr. Wm. Paul Gerhard, consulting engineer, New York. It contains some new experiences and references and should be in the possession of every member of the craft. Readers of SANITARY ENGINEER are well acquainted with the work of Dr. Gerhard, he having contributed many splendid articles in days gone by.

The booklet can be procured from the author, the price is 20 cents postpaid.

OTTAWA TECHNICAL CLASSES

(Continued from page 14.)

experienced, considers principally, if not solely, the first cost of plumbing. The initial price of the best procurable plumbing and drainage, which is the only kind that will assure long, ample, and dependable service, usually frightens him into ill-advised and ultimately hazardous economies. If he seeks to save by using inferior fixtures, piping and fittings, the value of his workmanship is diminished. If he attempts to have the best pipe and fittings installed by cheap workmen, the economy is a similar extravagance.

Plumbing value and service are like a chain and every chain is as strong only as its weakest link.

On guard, ye sanitary engineers. Your sector may be next to be attacked. Let every member of the craft, whether he be engineer, plumbing inspector, editor, or manufacturer, do his bit. You can assist humanity in a great measure by insisting upon the enforcement of sanitary regulations that safeguard the health of the worker in the home and the factory.

CONDENSATION UTILITIES

Above is the title of loose leaf folder style booklet which is being issued to the trade by the Canadian Fairbanks-Morse Co., Ltd., Montreal and Toronto.

The booklet contains 24 charts and drawings which describe a large variety of plans showing how condensation can be returned and fed back to the boiler without the use of steam pumps.

It also contains a chart showing the coal that can be saved by increasing the temperature of the feed water by rising the Farnsworth machines, with closed sysems, keeping the condensation under pressure, etc.

The publishers of the booklet are the Farnsworth Company, Conshohocken, Pa., the Canadian Fairbanks-Morse Co. being the Canadian distributors. These booklets may be procured by writing either of the above named firms.

A policeman popped his head inside a crowded car.

"Excuse me, ladies and gentlemen," he said, "but there are two swell thieves in here."

"Dear me!" cried a nervous-looking individual. "I cannot risk my reputation in here."

Up jumped another gentleman with a gold watch chain and white waistcoat.

"I must get out at once," he said. "I have just taken some money out of the bank and I won't chance being robbed."

The policeman nudged the conductor.

"It's all right now, drive on; they've both got out."

Hanna, Alta.—The municipality is attempting to interest the Canadian officials in a proposal to divert Bull Pond creek so as to make it freshen the whole lake and thus render it a fit source of water supply.

MARKET CONDITIONS AND TENDENCIES

(Continued from page 24.)

of 60c per pound has been made during the week. Stocks are by no means heavy, government work absorbing practically all supplies. In the primary a quiet market exists at the newly-established price.

PIG IRON.—Slight improvement continues in receipts of coke but Canadian production shows little improvement as yet. The demand is heavy but little disposition is evidenced to accept business. Foundry iron shows no change in price, being quoted at $49.50 per ton.

"STORY OF A LUMP OF COAL"

The lecture which the Company Educational Director has been delivering, entitled "The Story of A Lump of Coal," is becoming one of the most popular educational talks in the city of Toronto. About 10,000 people have already heard it. Applications for this lecture have come in from schools, colleges, young people's associations, women's meetings, recreation centres, and other bodies, and it has been quite a problem to arrange dates for all of them. However, we have managed to satisfy all parties and can arrange for a few more lectures for future dates.

The coal problem has been such a serious one of late that this lecture becomes a very interesting one on that account.

The lecture consists of 150 lantern slides, takes one and a quarter hours to deliver. Some of the subjects touched on by the lecturer are:—The Early Plant Life from which Coal is Formed; Coal Mines and Mining Scenes; The Wonderful By-products of Coal; Coal Tar and Its Wonders; The Great Chemical and Dye Products Industry; The Early Days of Gas Making; Gas Manufacture; A Trip Through a Gas Works. Many other interesting features in connection with the war, and how important a place coal and gas manufacture has in connection therewith, is brought out during the talk. Address all communications regarding this lecture to—The Educational Director, Consumers' Gas Company, 19 Toronto Street, Toronto. Only a few dates open between March and July, 1918.



The best advertising you can get is to satisfy your customers and the most exacting customer will be thoroughly pleased with the quiet operation of the

TRADE SILENTFILL MARK

NO NOISE.

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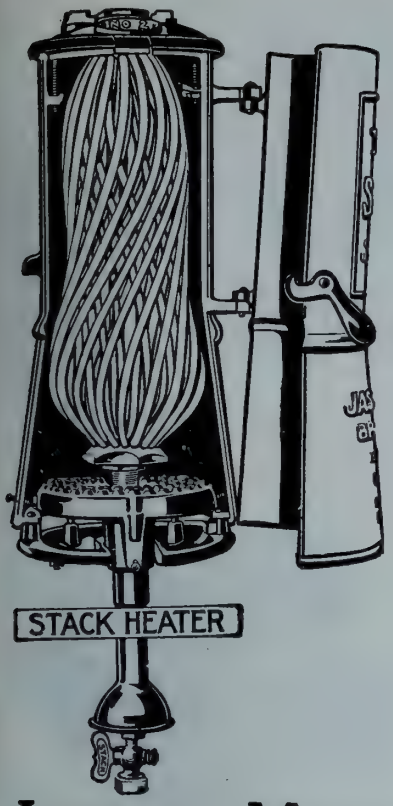
40-42 Lombard St., Toronto, Can.

Telephone Main 2016

EFFECTIVE DISPLAY OF BATHROOM SUPPLIES

The following recently appeared in the local newspaper of the town of Salmon Arm, B.C.:—

"Go 'way! I want to have a bath," is the announcement which confronts the gazer who looks at the natty little lay-out at the S-A-F-E store window. On taking a closer view one realizes that all the bathroom requisites are in their appointed places and a smart little maid dressed in a saucy little kimono is about to emerge from behind a screen. It is a very attractive piece of window dressing and is all the more noticeable as so few stores in this city take the time or trouble to display their goods to their best advantage; in other words they have the window-space and the goods but do not make the most and best of their opportunities in this nature that attract attention and it is surprising that more displaying is not done in Salmon Arm in this direction.



The simple natural law

that water has a tendency to rise on being heated is taken into account in the construction of the Stack Gas Water Heater. The copper water pipes rise almost perpendicular from the base of the heater where the gas flame comes into contact with them. This means rapid circulation and quickly heated water. It is the reason why the Stack Heater will heat small quantities of water with less gas than any other heater.

It is a convincing fact to intending purchasers.

James Morrison Brass Mfg. Co., Limited

93-97 Adelaide Street West, TORONTO

HOYT METAL GOODS ARE KNOWN

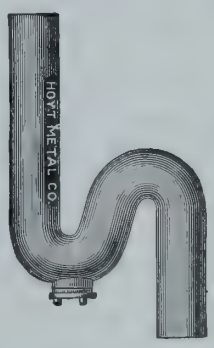
FROM COAST TO COAST



As time-savers there are none equal to our Wiping Solder, Bar or Wire Solder.

Hoyt Lead Traps, bends and waste pipe are in a class by themselves.

All our products are made to formula.



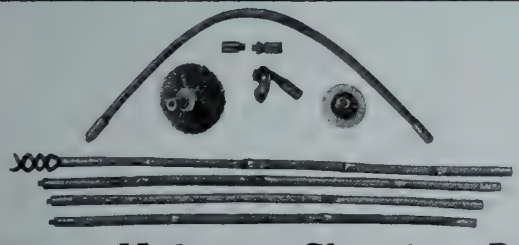
Our Mixed Metal Sales Amount To Over $5,000,000 Annually.

Write your Jobber

HOYT METAL COMPANY, TORONTO, ONTARIO

New York, N. Y., London, Eng., St. Louis, Mo.

Write Us



Rogers Malacca Cleaning Rods

for cleaning boiler tubes, chimney flues, soot chambers and underground fitings—saves excavating. Fitted with Scraper, Brush, Screw and Plunger.

DARLING BROTHERS LIMITED

120 PRINCE STREET - - - MONTREAL

IT IS IMPORTANT!

If you have something to dispose of in goods or service that as many buyers as possible get to know you and your product. This can be accomplished through

Sanitary Engineer

143 University Avenue, Toronto

When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER.

Fifty Subscriptions from One Firm

THE International Business Machines Company, of which Mr. Frank E. Mutton is vice-president and general manager, subscribed to 10 copies of THE FINANCIAL POST some months ago—these copies to go to their travelling salesmen. Now this company has increased the number of these subscriptions to 50 because the results of the experimental subscriptions have proved so satisfactory.



FRANK E. MUTTON

Mr. Mutton explained that the object of putting THE POST in the hands of the men of his company was to keep them intelligently acquainted with general business conditions in Canada. He said he knew no better paper than THE POST for the purpose. It would seem that his men have responded fully to effort made to keep them well informed about Canadian business affairs—so much so that the management have added 40 other men to the original 10 to receive THE POST.

When Mr. Mutton was with the National Cash Register Company as its Canadian manager, he was the king of all managers in the matter of sales records. In this position he achieved a big reputation built on solid achievements. He learned salesmanship in a school where competition was of the hottest kind, and where the competitors were brilliant men. Giving Mr. Mutton full credit for superior personal qualities and energy of the most ardent kind, it is taking nothing away from him when it is said that not a little of his success was due to his intimate and sympathetic **knowledge of the other man's business.** And he taught the men associated with him as salesmen to know the point of view and requirements of the men they called on to sell machines to.

As vice-president of the International Business Machines Company, Mr. Mutton is putting into operation an idea used by him in past days with brilliant results—he is causing his salesmen **to know the business and requirements of their prospective customers.** To establish points of contact swiftly and surely is one of the open secrets of successful selling.

In the case of **your** solicitations of customers and desired customers, it is excellent strategy to have your salesmen so well informed about business conditions generally, and about the interests of the men they canvass, that they will be able almost instantly to relate their proposals to the interests of the buyer. When a salesman shows himself intimate with the interests or business or objectives of the man whose order he wants, he is immensely strengthened as a salesman, and his percentage of successful canvasses goes steadily up.

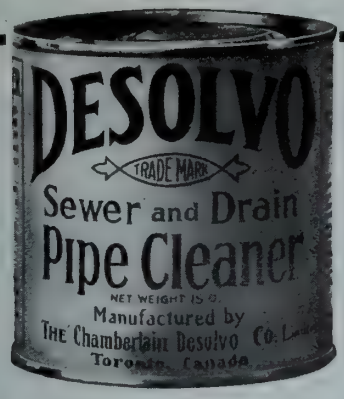
Our definite suggestion to you is: Subscribe to THE POST yourself, and learn from its pages how your salesmen or executives can draw power from this newspaper. Then, having acquired the sought-for knowledge, subscribe to THE POST for each man in your service who can profit you by knowing what is in THE POST each week. If Frank Mutton is making a success of THE POST as a salesman's aid, it is reasonable to suppose that other managers of salesmen and executives can likewise employ THE POST as a producing agent. And so we ask you to sign and forward the coupon below.

The MacLean Publishing Company, Limited.
143-153 University Ave., Toronto.

Send me/us THE FINANCIAL POST OF CANADA (weekly). Subscription price of $3 will be remitted on receipt of invoice in the usual way. Have this copy sent to

....

....



Desolvo turns the trick every time

There has never been a choked drain or a frozen stack that has defied Desolvo. Every time Desolvo is used it gets right at the obstruction and quickly removes it without damage to pipes or fittings.

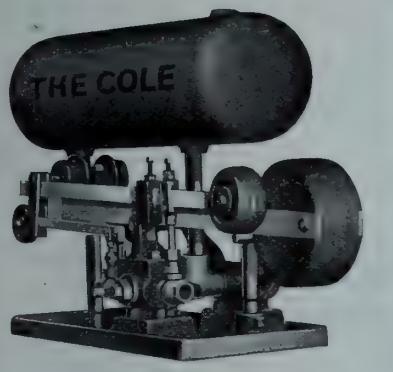
Desolvo is the most effective pipe solvent and the simplest to use, the only pipe cleaner that works successfully when mixed with cold water.

If you have never tried Desolvo, drop us a line or your own letterhead, giving your jobber's name, and we will send a trial can absolutely free!

DON'T FORGET TO MENTION JOBBER'S NAME.

Chamberlain Desolvo Co., Limited, Toronto

STEVENSON BUILDING, CHURCH ST., TORONTO. General Offices, Pittsburgh, Pa.



The Cole Trap for Handling Condensation

You have seen this before.

Do you know what it is?



If you do, you've made some money installing it.

For the past year by our records steamfitters' profits on this line equals $10,000.00, and only a few divided it between them. Get after your share.

Write us. Watch our advts.

GEO. W. COLE, LIMITED

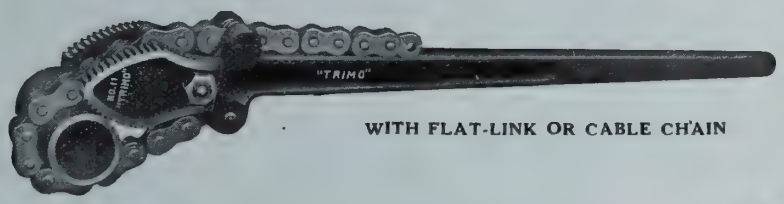
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World-Famed Specimens of the Age of Steel

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TOOLS

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TRIMONT MFG. CO., 55 Amory St., Roxbury, Mass., U.S.A.



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THE "WANT" AD.

The "want ad." has grown from a little used force in business life into one of the great necessities of the present day.

Business men nowadays turn to the "want ad." as a matter of course for a hundred small services.

The "want ad." gets work for workers and workers for work.

It gets clerks for employers and finds employers for clerks. It brings together buyer and seller, and enables them to do business though they may be thousands of miles apart.

The "want ad." is the great force in the small affairs and incidents of daily life.

Kindly mention this paper when writing advertiser

When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER.



Mr. Farmer's sewage disposal system

Up-and-doing Sanitary Engineers are going out strong after rural business. The Farmer was never in a better financial condition than he is to-day and he's willing to spend his money on home conveniences.

In figuring on a sanitary sewage disposal system for the Farmer always specify the "Anthes" Syphon and "Anthes" Soil Pipe. Thus you can assure your client of a permanent job that will operate successfully at all times.

Make every farm job you put in this spring help you to get more business in the same neighborhoods next spring. Don't use "cheap" pipe, "the Permanent Pipe" is the cheapest in the end.

ANTHES FOUNDRY LIMITED

TORONTO and WINNIPEG



Pipe Fittings

Made in Canada

M

The Brand that has the Quality

M Brand Pipe Fittings, etc. give a service and satisfaction that will invariably get you re-orders and much new business as well.

A trial of the goods will prove this claim.

CAST IRON FITTINGS

With this brand mean fittings made with iron of high tensile strength—proper proportions and correct tappings.

RECESSED DRAINAGE FITTINGS

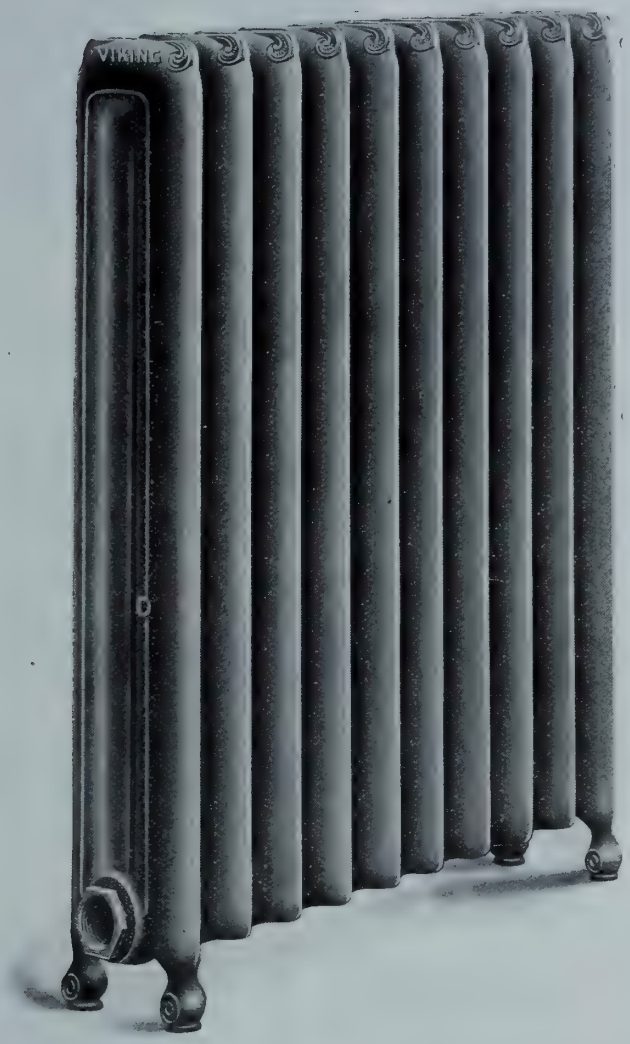
MALLEABLE FITTINGS

With this brand mean fittings made of Air Furnace Refined Iron, reamed and tapped to gauge with perfect threads.

Standard and Extra Heavy Flanged Fittings and Flanges. Galvanizing Malleable and Gray Iron Castings of all Kinds.

International Malleable Iron Co., Limited, Guelph, Ontario, Canada

Daisy Boilers and Viking Radiators Have No Equal



BACKED BY OVER 50 YEARS OF PRACTICAL EXPERIENCE

For Efficient and Economical heating, specify Daisy Hot Water Boilers and Viking Radiators and conserve the fuel for your country by this installation.

The Daisy Boiler is manufactured only by

WARDEN KING LIMITED, MONTREAL

BRANCH, 200 Adeaide St. W est, TORONTO

A REAL ARISTOCRAT
BOTH BY NAME AND NATURE

It's a tub that's in a class by itself and has won itself a name that is embodied in its make-up in every detail.





LET US SEND YOU ONE

Seeing is believing these days and when we say we have the best tub in Canada, and made in Canada, we want you to see the goods.

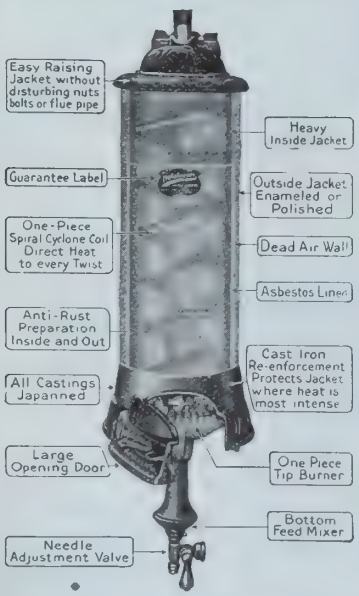
One authority on plumbing goods with over 25 years' experience said he had never seen a tub like them for finish, design and points of good quality. These tubs are backed by every dollar we own.

THE CANADA METAL COMPANY, LIMITED

Montreal Hamilton TORONTO Winnipeg Vancouver

WE HAVE EVERYTHING FOR THE PLUMBER **Write for Catalogue "A"**

Service-Speed-Economy



The Hotstream HEATS IN A HURRY TRADE MARK REG. WATER HEATER

BEST FOR BAD WATER

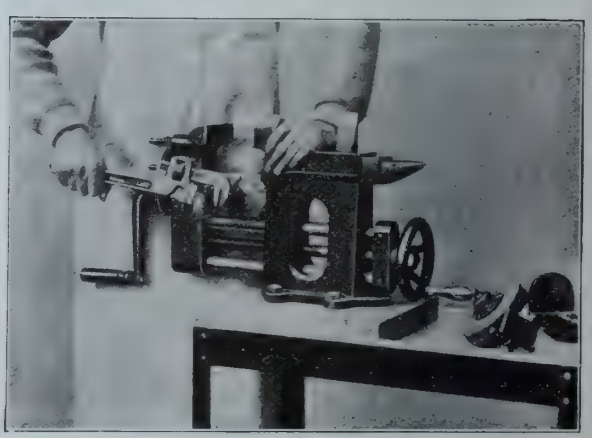
Quality Survives

Also Made With Cast Iron jacket.

The Hotstream Heater Co.
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W. H. CUNNINGHAM, 98 Kingswood Rd., TORONTO
Canadian Representative

THE
Stewart Handy Worker
An Equipment All in One



WEIGHS 90 POUNDS

The Equipment Comprises——

A Pipe Vise
A Bench Vise
A Bench Grinder
A Two-Speed Drill
A Hardy Cutter
An Anvil

It's not a toy. It's a real combination of practical tools for practical people.

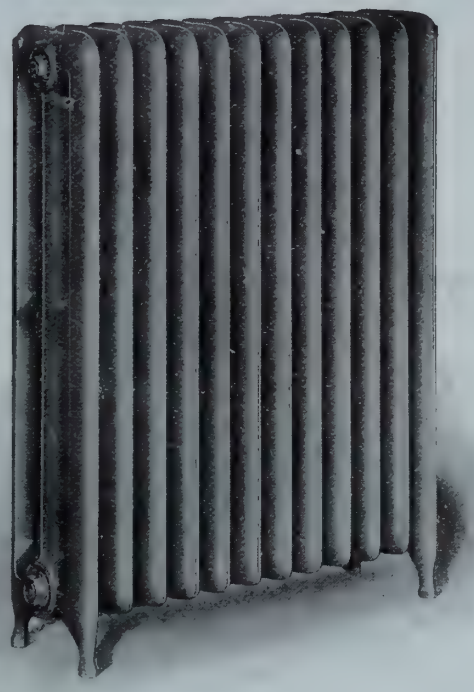
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CHICAGO FLEXIBLE SHAFT COMPANY
12th Street and Central Avenue
Department H.W. **CHICAGO, U. S. A.**

Freer Circulation means greater heat

Imperial Radiators by being smooth inside offer no obstruction to the passage of water. Consequently circulation is rapid and the water in the radiators has no time to cool.

Imperial Radiation means constant and even heat in all parts of the building at a minimum fuel cost. Heat waste is reduced to a negligible quantity, practically all heat being given off from the radiators.



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Head Office, FRASER AVENUE, TORONTO

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Classified Buyers Guide

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United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Air Valves.
Beaton & Cadwell Mfg. Co., New Britain, Conn.,
Beaton & Corbin Mfg. Co., Southington, Conn.
Canadian Wolverine Co., Ltd., Chatham.
C. A. Dunham Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.

Asbestos Goods.
James Morrison Brass Mfg. Co., Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

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C. A. Dunham Co., Ltd., Toronto.

Drainage Fittings.
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.

Drinking Fountains.
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Puro Sanitary Drinking Fountain Co., Toronto.

Ejectors, Steam.
James Morrison Brass Mfg. Co., Ltd., Toronto.
Kerr Engine Co., Walkerville.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Enamelware.
Amherst Foundry Co., Ltd., Amherst, N.S.
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Standard Sanitary Mfg. Co., Ltd., Toronto.
Port Hope Sanitary Mfg. Co., Ltd., Port Hope.
L. Wolff Manufacturing Co., Chicago.

Electric Pumping Machinery.
Empire Mfg. Co., Ltd., London and Toronto.
Ontario Wind Engine & Pump Co., Ltd., Toronto.

Fittings.
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Flushometers.
Canadian Brass Co., Ltd., Galt, Ont.
Canada Metal Co., Ltd., Toronto.
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Standard Sanitary Mfg. Co., Ltd., Toronto.
L. Wolff Manufacturing Co., Chicago.

Floor and Ceiling Plates.
Beaton & Cadwell Mfg. Co., New Britain, Conn.,
Beaton & Corbin Mfg. Co., Southington, Conn.
Canadian Wolverine Co., Ltd., Chatham.
Galt Brass Co., Ltd., Galt.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
James Morrison Brass Mfg. Co., Ltd., Toronto.
Steel & Radiation, Ltd., Toronto.

Gasoline Engines.
Ontario Wind Engine & Pump Co., Ltd., Toronto.

Gas Water Heaters.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Ltd., Galt.
Holstream Heater Co., Cleveland.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Pittsburg Water Heater Co., Toronto.

Generators.
James Morrison Brass Mfg. Co., Ltd., Toronto.

Heaters.
Lord & Burnham Co., Toronto.
Steel & Radiation, Ltd., Toronto.

Lead.
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Ltd., Galt.
Hoyt Metal Co., Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

Mixing Valves.
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Port Hope Sanitary Mfg. Co., Ltd., Port Hope.

Monkey Wrenches.
Trimont Mfg. Co., Roxbury, Mass.

Packing.
Canadian Wolverine Co., Ltd., Chatham.

Packless Radiator Valves.
Kerr Engine Works, Walkerville.

Pipe and Radiator Hangers.
Beaton & Cadwell Mfg. Co., New Britain, Conn.,
Beaton & Corbin Mfg. Co., Southington, Conn.

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Canadian Tube & Iron Co., Ltd., Montreal.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.

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Chamberlain Desolvo Co., Ltd., Toronto.
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London and Toronto.

Pipe Cutters.
Trimont Mfg. Co., Roxbury, Mass.

Pipe Joint Compounds.
Canadian Wolverine Co., Ltd., Chatham.
James Morrison Brass Mfg. Co., Ltd., Toronto.

Pipe, Soil, and Fittings.
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Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Toronto Hardware Mfg. Co. Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.
Warden King, Ltd., Montreal.

Pipe Threading Tools and Machinery.
Borden Canadian Co., Toronto.
John Hall & Sons, Ltd., Brantford.
A. B. Jardine & Co., Hespeler.

Pipe Wrenches.
Borden Canadian Co., Toronto.
Trimont Mfg. Co., Roxbury, Mass.

Porcelain Ware.
Canada Metal Co., Ltd., Toronto
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
L. Wolff Manufacturing Co., Chicago.

Pumps.
C. A. Dunham Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Ltd., Galt.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Ontario Wind Engine & Pump Co., Ltd., Toronto.
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Steel & Radiation, Ltd., Toronto.
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Beaton & Cadwell Mfg. Co., New Britain, Conn.,

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Simplex Manufacturing Co., Chicago.

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Empire Mfg. Co., Ltd., London and Toronto.
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James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

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Hoyt Metal Co., Toronto.

Steam Specialties.
Dart Union Co., Ltd., Toronto.
C. A. Dunham Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Kerr Engine Co., Walkerville, Ont.
James Morrison Brass Mfg. Co., Ltd., Toronto.
United Brass Founders and Engineers, Ltd., Cornbrook, Manchester, England.

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Canadian Morehead Co., Ltd., Woodstock.
C. A. Dunham Co., Ltd., Toronto.
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James Morrison Brass Mfg. Co., Ltd., Toronto.

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Ontario Wind Engine & Pump Co., Ltd., Toronto.

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James Morrison Brass Mfg. Co., Ltd., Toronto.

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H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Trimont Mfg. Co., Roxbury, Mass.
Williams, J. H., & Co., Brooklyn, N.Y.

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Dart Union Co., Ltd., Toronto.
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C. A. Dunham Co., Ltd., Toronto.

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H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Ontario Wind Engine & Pump Co., Ltd., Toronto.
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Wolff Installation, Goodman Plant, Chicago, Ill.

INCREASED EFFICIENCY in factories, business houses and schools follows the installation of high-grade plumbing, which insures the best sanitation and improved working conditions.

Wolff Plumbing

is the plumbing that makes for efficiency. It has been the standard of quality for over 60 years. It measures up to every requirement of the modern building. Write for catalogue.

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OPEN VIEW NO. 10-A.

The CEILING PLATE that's better



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THE NO. 10—A NARROW FLANGE PLATE IS A STEEL HINGED PLATE. FLANGES ¾" WIDE. HIGHLY FINISHED. ESPECIALLY DESIGNED FOR TWIN CONNECTION "NARROW."

The split ceiling plate is coming more and more into use than ever and ALWAYS GIVES A NICE FINISH, because it can be attached to mains and risers at the very last, and is not exposed during completion of a building on the floors.

High quality at the right price.



Gem No. 4.

Gem No. 4 Automatic Air Valve

Made from the best brass obtainable. Pressed shell and pressed brass base which eliminate danger from blowholes, which is a fault with cast bases.

Write for catalog showing our complete line of specialties.

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Steam and Water Fittings

WROUGHT PIPE

BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES

Black and Galvanized All Sizes

Ask your jobber for CT Brand

CANADIAN TUBE & IRON CO., LIMITED

Montreal Works: Lachine, Can.

After the War——What?

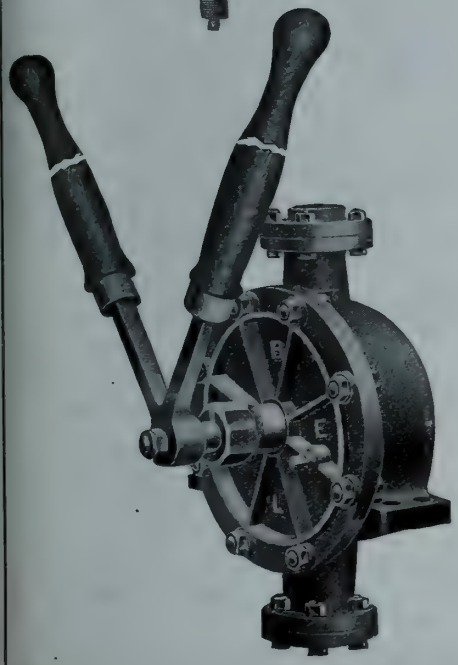
The time to put on fire insurance is before the fire. The time to prepare for after-the-war conditions is before peace comes.

Advertise now and be prepared to keep your goods in demand through the medium of SANITARY ENGINEER.









FIVE WORKS—OVER 3,000 EMPLOYEES

It is our intention after the War to devote our energies to the intensive production of the following Specialities:

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If you are interested in any or all of the lines mentioned and are in a position to take a hand in the energetic distribution of the same, please communicate with us NOW to our Head Office.

United Brass Founders and Engineers, Limited

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Cornbrook, Manchester, England



PIPE THREADING AND CUTTING TOOLS

One Man Can Thread up to 12 Inch.

You cannot afford to expect your men to make horses of themselves. If they did they could not keep it up. Our tools save time, do better work and makes life worth living for your men.



Cuts Without Burring

No. 1 cuts from ⅛″ to 1″
No. 5 cuts from ½″ to 2″
No. 10 cuts from 2½″ to 4″
No. 15 cuts from 4″ to 6″

Ratchet	Geared
No. 6—¼″ to ¾″.	No. 41—2½″ to 4″.
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No. 26—1″ to 2″.	No. 80—4½″ to 8″.
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TORONTO, CANADA

WE SPECIALIZE

In the Manufacture of

CAST IRON SOIL PIPE and FITTINGS

as well as

GALVANIZED RANGE BOILERS AND EXPANSION TANKS
FOR HEATING SYSTEMS

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"HAUSE" PIPE JOINT CEMENT

For steam, water, air, oil, gas, gaskets, etc. The cement that cements. Sets like gum. Allows no leaks.

The Great Value of "HAUSE PIPE JOINT CEMENT" lies in its peculiar chemical properties which permits of its hardening and expanding after the joints are made up. In making up joints it has the same effect as a lubricant on the best graphite, and while the joints may be made and broken readily, a perfectly tight joint is maintained at all times. Comes in 1-lb., 5-lb., 15-lb., 25-lb., 50-lb. cans, 100-lb. barrels. Manufactured in ready mixed and powder form. Ask your jobber for prices, or write us direct.



Manufactured in Ready Mixed and Powder Form.

Made in Omaha, Neb., U.S.A., by

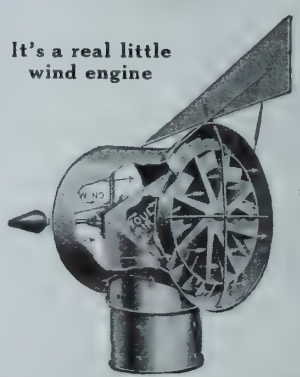
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THE BICALKY

VENTILATOR

Is a positive suction fan that ventilates

It's a real little wind engine



The "Bicalky" will dispense with all auxiliary heaters on local ventilation systems.

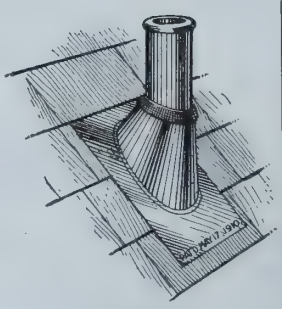
It is, as far as we know, the most scientifically constructed, self-propelled fan ventilator on the market.

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The SIMPLEX Adjustable Roof Flange

Fits any roof from ½ pitch to flat—just slide it down the pipe and it will conform with the pitch of the roof.



Trade Price 2″ $1.00 4″ $1.15

Made in all sizes—For sale by nearly every jobber

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Special Narrow Rim "B & C" No. 15



Combination Plate made expressly for the Canadian Trade

Sizes ½ to 2 inch.

Similar to No. 10 Steel Plate

One of our many styles of narrow flange plates.

A stock of these goods carried for the convenience of our customers by our Canadian Representative

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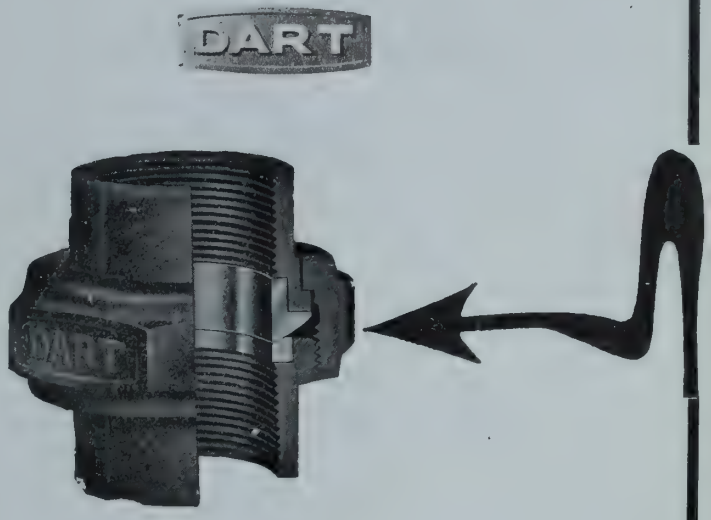
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Right, where Durability is Required

Dart Unions are strong and permanent, "Bronze to Bronze at the Joint" is the secret of the long life of Dart Unions---a permanent, rust-resisting metal at the point where joint is made.

Use Dart Unions and you make certain of permanent connections.

Your Jobber Sells Them



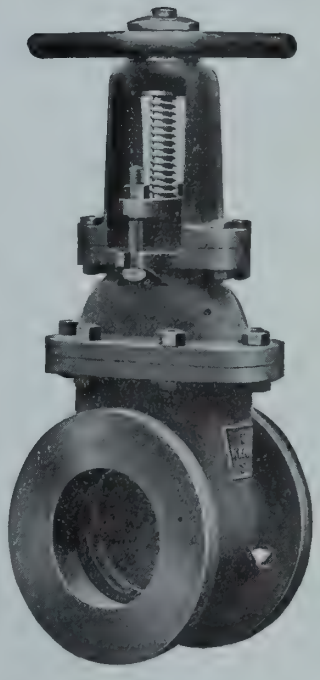
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There Are Lots of Gate Valves



advertised and sold, but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.

Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.

Approved by the Fire Underwriters Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

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Registered **PERFECTO** *Trade Mark*

Mr. Sanitary Engineer:

Do you use the best Brass Goods in all your work?

Did you ever stop to think that the Brass Goods you install in each plumbing job control the service given by your up-to-date Plumbing Fixtures?

The use of PerfectO High Grade Brass Goods will materially help to maintain your reputation of giving the best service and satisfaction to your customers, and through them get new customers.

Finish that job with PerfectO Brass Goods, each piece individually tested and guaranteed.

Send your order in now and we will ship it the day it is received.

Yours truly,

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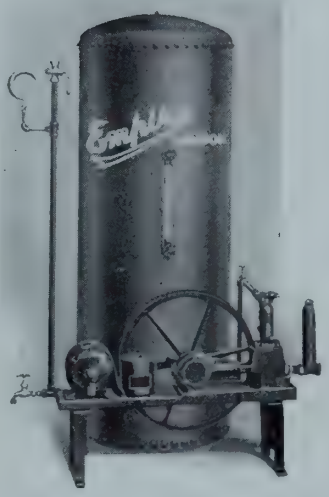
PLUMBER & STEAM FITTER of CANADA

Vol. XII. Publication Office, Toronto, April 15, 1918 No. 8



Cultivate Rural Business

TOO long the Farmer has been neglected by the average sanitary engineer. True, many water systems and much plumbing have been installed in country homes, but the great possibilities of the rural field remain as yet untouched. Right now the Farmer looms large as a spender and a home improver, and it's strictly up to sanitary engineers to see that he gets in proper equipment full value for his money.



IF you will study our brochure on "Water Supply Systems" you will acquire a new idea of the possibilities the farm offers in the way of strictly new business. An Empire Pneumatic Water System is the beginning, for running water under pressure is the first requisite of any rural plumbing system. The installation of such a system is as profitable as you could wish, and it opens the way to much other business. We are prepared to help you in selling and installing. Will you write us about it?

EMPIRE MANUFACTURING CO., LIMITED

LONDON TORONTO

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While



A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for BEAVER BRAND CAST IRON ENAMEL WARE

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For more than half a century our Canadian Rubber Factory has been manufacturing Rubber products. That experience has taught us how to produce qualities that will stand the test of wear.

Every detail in manufacturing is carefully supervised and the greatest care is exercised in the choice of materials. Our facilities for buying, manufacturing and distribution make it possible to produce Mechanical Rubber Goods that represent the best possible values.

As a result, the Dominion Rubber System products are recognized throughout Canada as the standard by which to judge Rubber qualities and Rubber values.

You can easily prove our claims by writing direct to our nearest branch for any need in Rubber. Prompt attention is given to all enquiries.

Canadian Consolidated Rubber Co.
Limited

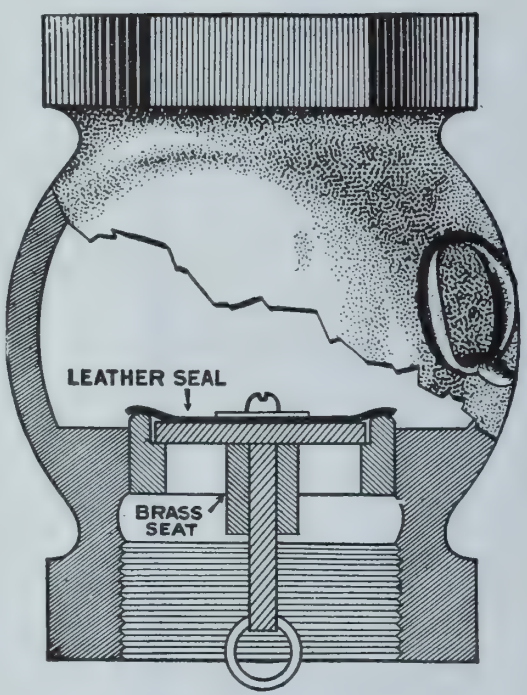
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'Q' FOOT AND PUMP VALVES



IT JUST CAN'T LEAK

WE are proud to announce to our friends in the trade that after considerble negotiation we have acquired the **Sole Rights for Canada of the "Q" Foot and Pump Valve**—it's the only real advance in the pump business in a generation—and **we have it.**

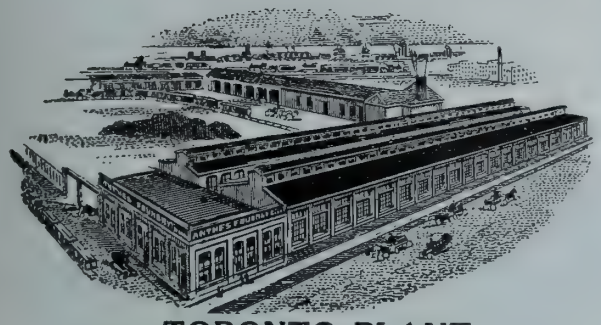
We are already manufacturing the valve in practically every size up to 8 inch, and we will use it in **every pump** of our manufacture to which it can be applied, as quickly as the patterns can be altered to receive it.

We'll be glad to send you prices.

R. McDOUGALL CO., Limited

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TWO PLANTS AT YOUR SERVICE



TORONTO PLANT



WINNIPEG PLANT

It may be a very easy matter to order your requirements, but it is another thing to get prompt deliveries.

We have two plants in operation and we keep a full line of Soil Pipe and Fittings ready for prompt shipment. Your Jobber need never let his stock run down, and you never need have a job tied up for want of such lines as we make.

Furthermore, cast iron soil pipe and fittings are the only kind to use inside the walls of a building for soil waste and drainage purposes.

It is false economy to try to cheapen a job by using pipe that is not as permanent as the building, and no one can prove that any material but cast iron will last as long as the building.

Cast iron pipe is permanent, has been used constantly in some of the largest buildings on this continent for over half a century and found as good as new by actual test.



Now is the time to call upon the farmer and rural resident. The country dwellers as a whole are financially better off than ever in the history of Canada.

No country home need be without city conveniences and no plumbing is complete without a sanitary sewage disposal system.

The only sanitary method is by means of the septic tank, and the heart of a septic tank is the syphon.

Anthes syphons are perfect. They have no moving parts, are made of cast iron, and are fully guaranteed to operate automatically at any pre-determined period. Once they are primed and started they require absolutely no further attention.

If you have any sewage disposal problem to solve write us for information. Our engineering department is at your service.

Every jobber can supply the "Anthes Syphon."

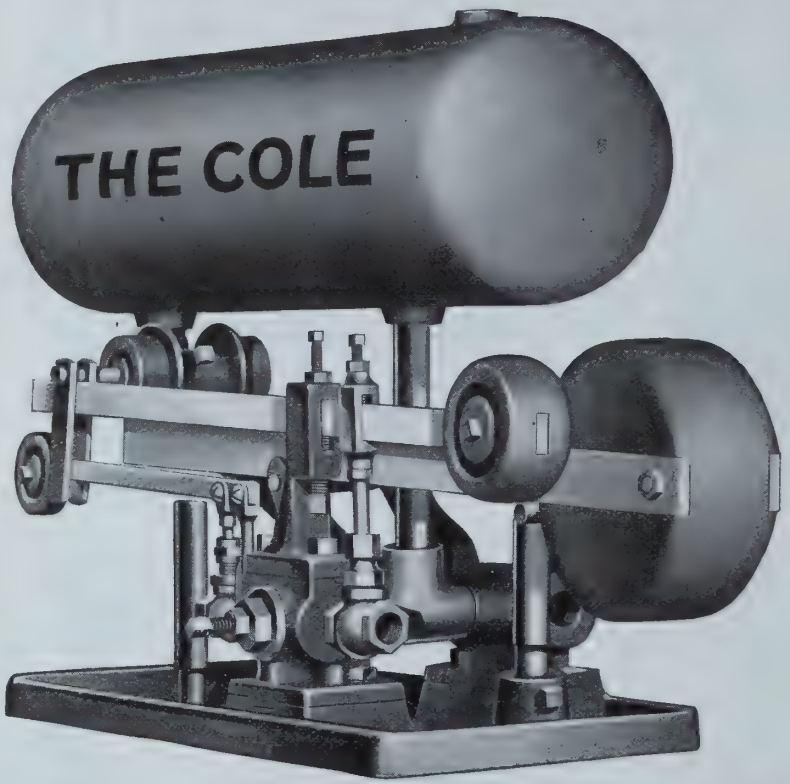
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SPECIFY "ANTHES" SOIL PIPE AND FITTINGS

ANTHES FOUNDRY LIMITED

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"THE SURVIVAL OF THE FITTEST"



THE COLE RETURN TRAP FOR HANDLING CONDENSATION

IF you are not already posted on this method of handling condensation, **we are**—and **you can** be for the asking.

Get ready for the coming season when all faulty steam heating systems should and can be economically overhauled.

Write us for specific information so that we can help you to save real money.

We started out in the face of keen competition to manufacture a **Real** Return Trap, and give Real Return Trap Service.

Why has our business expanded at such a steady rate during the past four years?

Because of the superior features of our products.

Because we stand behind every machine we make.

Because we protect the people who handle and use our goods.

Our business **has increased over 1,000 per cent. in less than four years.** And as our business has increased, those who have installed our products, have shared in this prosperity.

What share have you had?

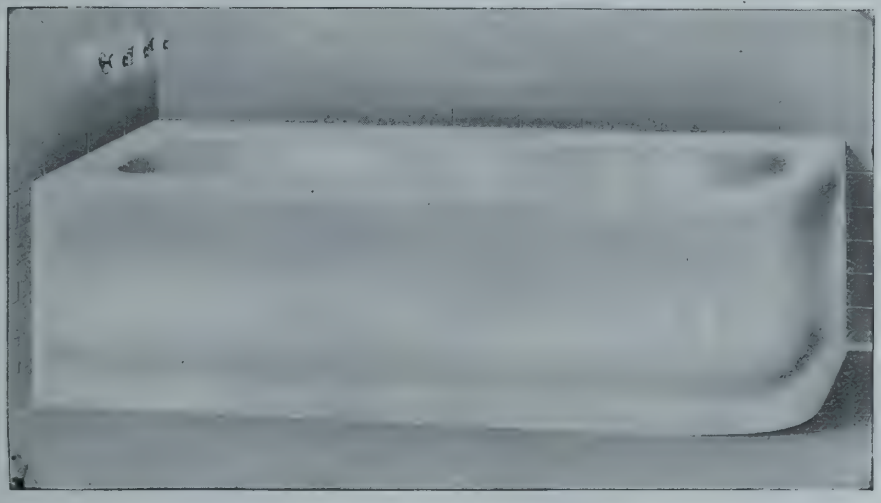
This is a good line for you to instal. There is a profit in it for you from every viewpoint.



Geo. W. Cole, Limited
2002 Dundas St. W., Toronto

"Standard"
"Perfection" Built-In Baths

Made in One Piece Enamelled All Over



These Baths represent the last word in design and finish, and are made to build into Right or Left Hand Corner or into a Recess.

The "Perfection" Built-in Bath is only 17½ inches high, therefore convenient. It builds into walls and floors, the absence of all dust-collecting cracks and corners, meaning bathroom sanitation.

Made in 5 and 5½ foot sizes.

Illustrations on request.

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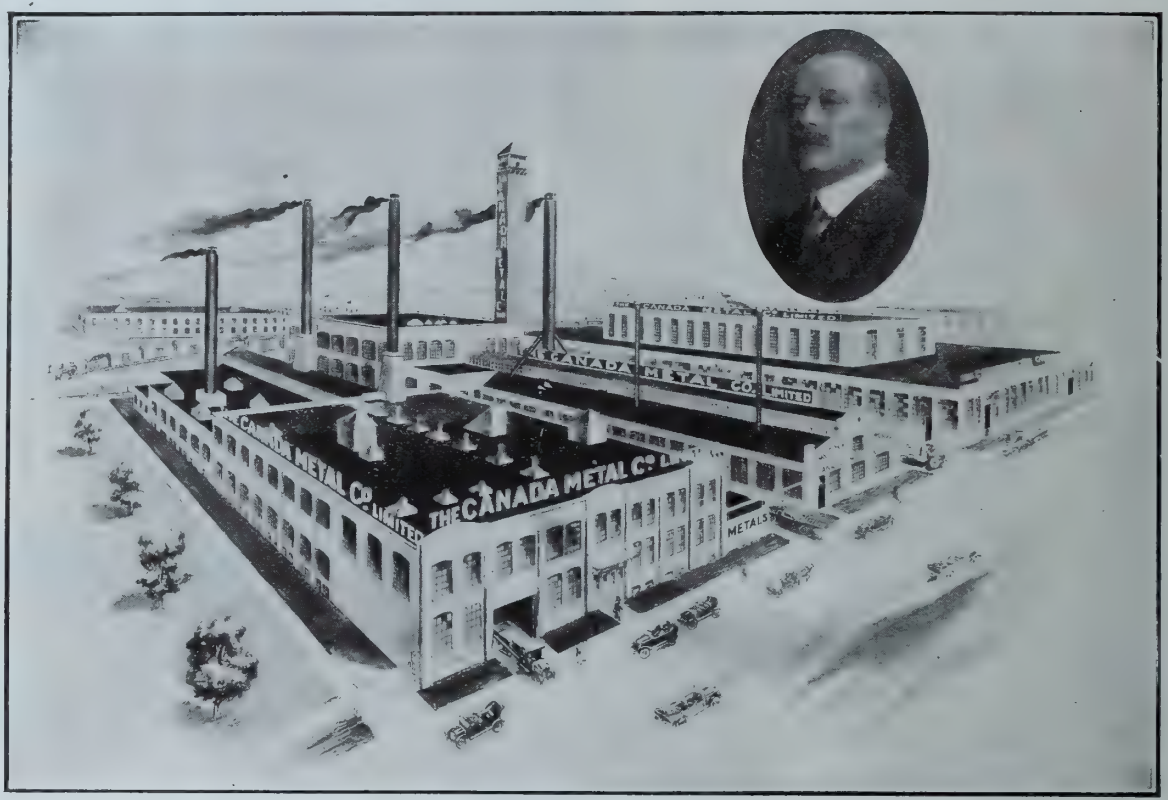
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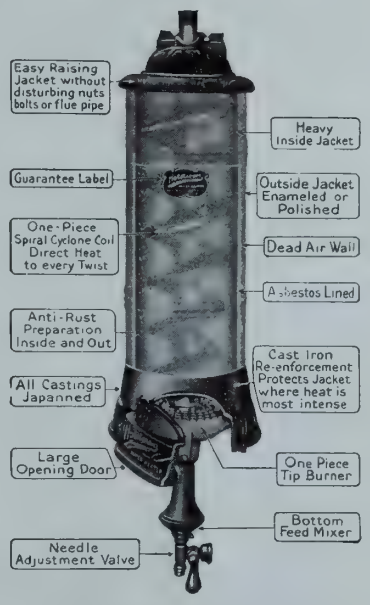
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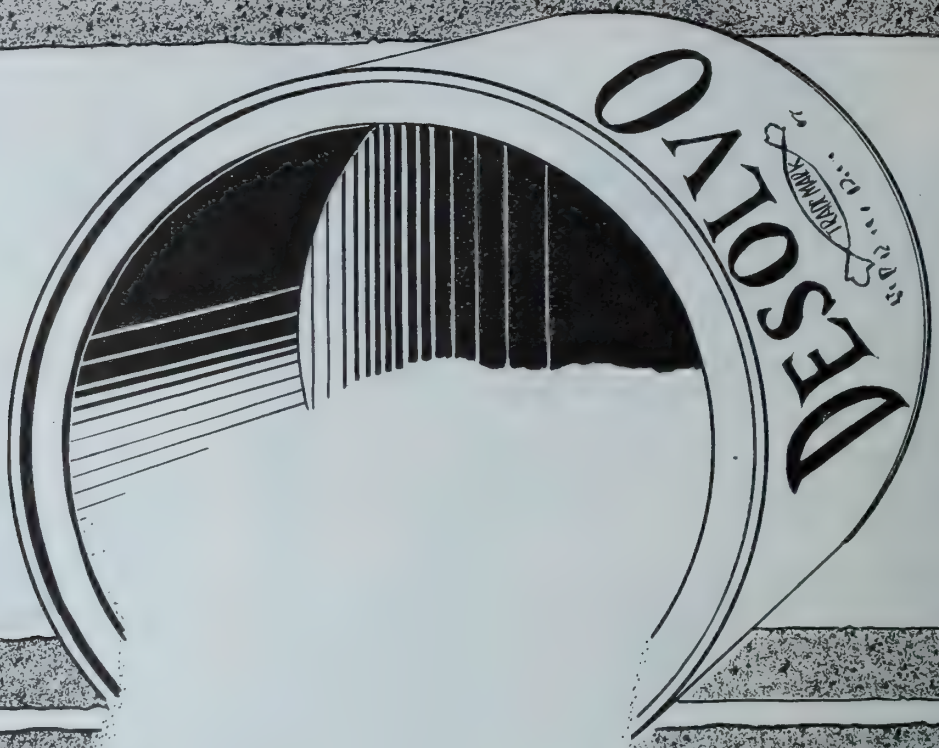
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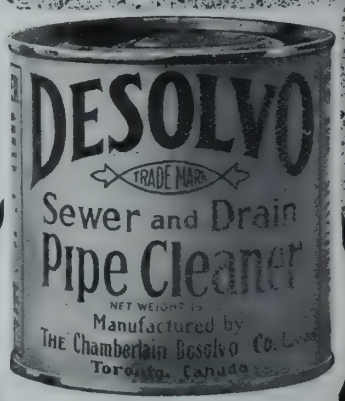


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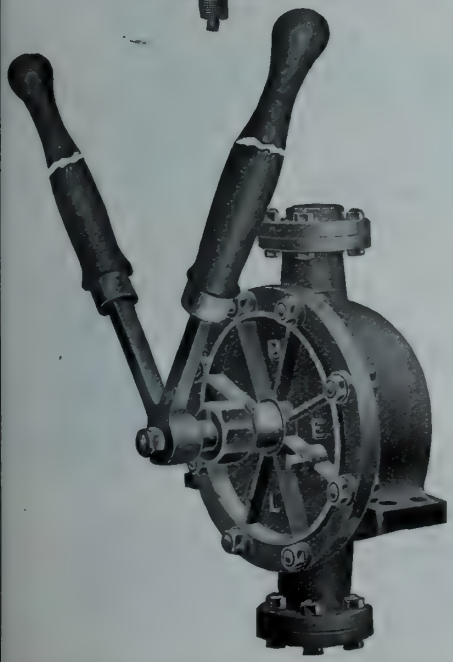
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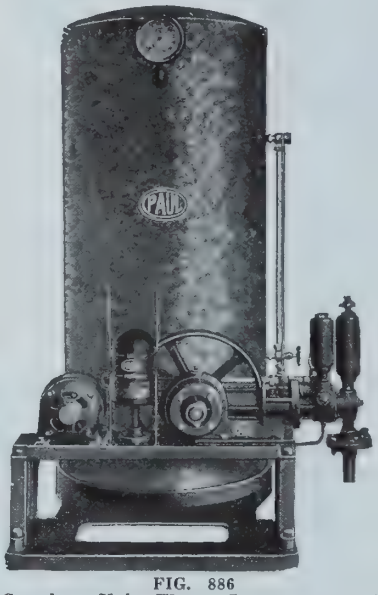
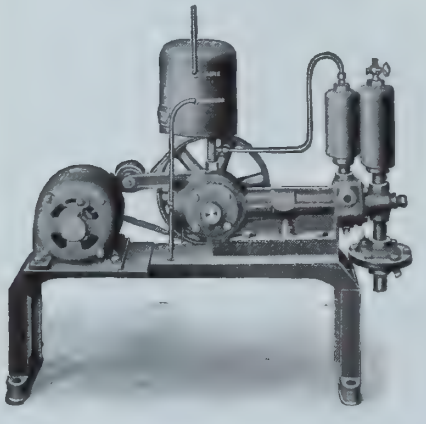


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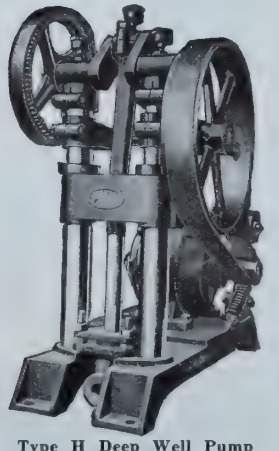
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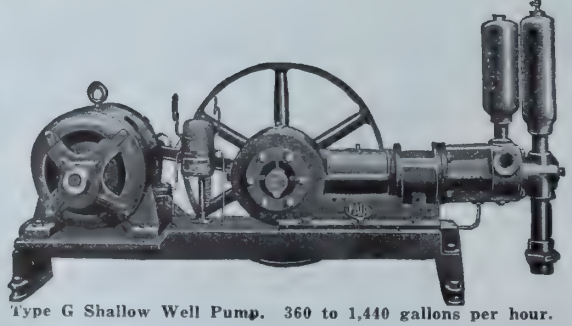
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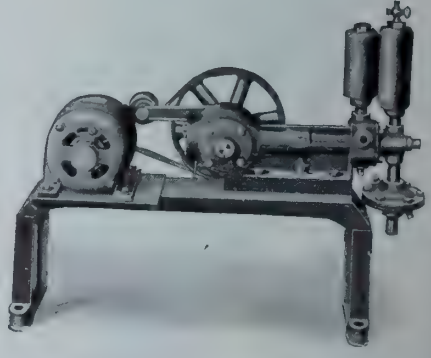
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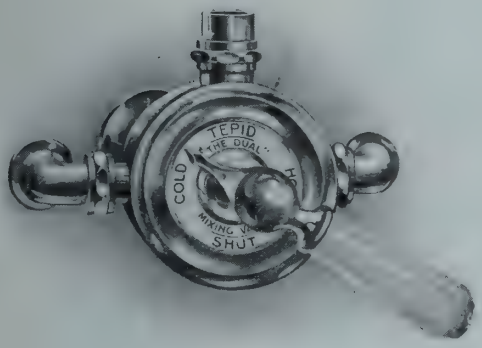
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For ease of operation, simple construction and easy installation, it has set a new standard of efficiency.

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SANITARY ENGINEER
PLUMBER AND STEAMFITTER OF CANADA

Vol. XII. TORONTO, APRIL 15, 1918 No. 8

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It is my demonstrator.

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It shows why there is three times more direct fire contacting surface in the top of a Burnham fire chamber than there looks to be.

The string looped up, corrugation fashion, measures 1 foot across. Pull it out straight and you have 3 feet.

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As a matter of fact, the average round Burnham Boiler is only about as large as the average parlor stoves of our boyhood days.

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Lord & Burnham Co. Limited of Canada

(Boiler Department)

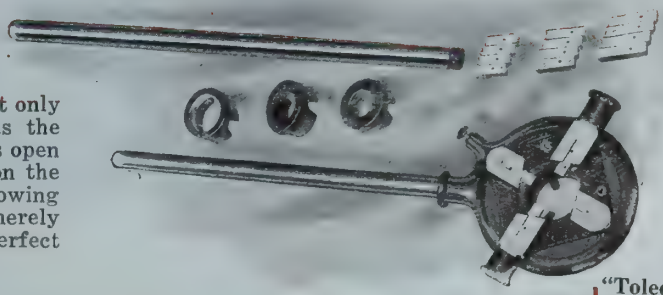
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Perfect Threads at one cut

"JARDINE" or "TOLEDO" Dies cut only with the mouth of the cutter. As the tool advances on the pipe the cutters open out so as to make a proper taper on the thread, the back of the cutters following in thread, do no cutting, they merely steady the tool. The result is perfect threads at one cut.



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With the mouth of the cutter doing all the cutting friction of cutter on pipe is reduced to a minimum. Every ounce of strength exerted is utilized in actually making the thread which means that the cut is made quicker with much less labor.

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With a Ratchet they work in any corner

The Ratchet feature of "JARDINE" and "TOLEDO" tools permits of threading being done on pipe actually in place, no matter in how awkward a position. The resultant saving on one or two such jobs often equals the price of the tool.

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DIMENSIONS:

Length over Rim	**47**	**inches**	**Width over Rim**	**22**	**inches**
Length inside Tray	**20¾**	**"**	**Length inside Sink**	**20¾**	**"**
Width inside Tray	**18**	**"**	**Width inside Sink**	**18**	**"**
Depth of Tray	**13¼**	**"**	**Height of Back**	**4**	**"**

Floor to top of Rim . . 32 inches

Note: It's a one-piece fixture, no joints or seams to get dirty, nicely rounded edges and corners, enameled inside with our best quality enamel, fully guaranteed, and painted white on the outside. It's a complete fixture, easy to set up and easy to keep clean. You can recommend it with every assurance that your customers will be pleased and satisfied.

Regular design is furnished with right or left-hand sink, and when specially ordered, wringer holder attachments can be supplied. Regular type can be shipped the day order is received; special equipment within a reasonable time. There will not be any delay, as the Factory was never in a better position than now to take care of rush orders.

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SANITARY ENGINEER

VOL. XII APRIL 15, 1918 No. 8

Guard the Plumbing By-laws

Medical Men as Well as Jerry Builders Would Seek to so Re-compile our Plumbing By-laws as to Make Them Both Impractical as Well as Insanitary—The Medical Health Officers in General Wish to Shirk the Responsibility

WE very much doubt if there is one other trade or profession that appears to hold the attention for attack as does the sanitary and heating engineering trade.

First, the average medical officer of health knows so little about plumbing and heating from the mechanical standpoint that he wishes with all his heart to get clear of it.

Second, the average city architect wishes to make himself overlord of anything and everything that goes into a building and he is not a practically trained man. He is an artist, a maker of pictures to scale. As far as the fundamental principles involved in the manufacture of the goods that are used in the plumbing and heating trade, he knows little about them. He is not, however, to blame entirely, except in so far as he assumes to know and therefore accepts a responsibility, etc., on behalf of his client. So far so good. Then there comes along that curse of all curses the bulk, or general contractor. He is at the beck of the shiftless type of architects, and he goes out to an architect's office, gets all the figures together and prices tendered for each department of work, and gives a bulk tender to the architect.

If his bulk tender is accepted, his next move is to peddle every job around, call upon Jones & Co., the sanitary and heating engineers, and declares with almost crocodile tears in his eyes that he is sorry to have to give the job to Brown & Co., because of the fact that the latter's price is away below that of Jones & Co.

The writer has traced jobs and has found out where deliverate untruths have been made in an endeavor to get one member of the trade to lower his price, etc. Then there is the big bulk contractor who takes a job on commission, as an example the new Parliament Buildings at Ottawa.

Wrought iron pipe and expensive fittings is a most expensive system as regards the roughing in especially and a proved impracticable job. The architect is the overlord, his word is law, and in actual fact he knows absolutely nothing about the business but puts his final O.K. on everything. He uses all kinds of second-hand evidence to prove his points and the men to whom he is responsible take his word for it. The Dominion Government have men in their every-day employment that know full well that the pipe being furnished as wrought iron pipe will not be as substantial as cast iron, but of course they have to hold their jobs and no interference is allowed, even when the public welfare is at stake.

Then we have the speculative jerry builder and the cheap jack manufacturer, though of the latter there are not many in Canada. This speculative builder is out to "enclose atmosphere." He doesn't care what heat loss means to the buyer of his "shacks." He only puts up shells full of cracks and crannies, uses unseasoned lumber or the lifeless weather-worn lumber from old buildings. Then he buys the very cheapest paint, makes the shack look something it is not and then goes out to rope in his victim.

That is one reason why in Canada approximately 8,500,000 tons of coal is wasted every year, which involves thousands of useless mileage of transportation every year. And to try and make this jerry builder build houses wind and weather proof is out of the question. Our city and town architects come back and tell us that "the duties of an architect do not involve the making of a house wind and weather proof" just so long as it will not fall down is all that the architect has to watch. In other words, no one seems to care how a building is built, or whether the material that goes into it is sanitary so long as it does not fall down and kill anyone or if all the occupants of the house were frozen to death because the building first of all was poorly built and impossible to heat, or if they died of pneumonia, tuberculosis, measles, typhoid, etc., because of cheap and badly executed plumbing work.

In fact, between the jerry builder, the

REPORT OF SPECIAL U. A. DELEGATE TO AMERICAN HEALTH ASSOCIATION

At the American Public Health Association meeting in Washington, October 17 to 20, a report was presented by Mr. Wells, chairman of the Committee on Plumbing and Drainage of Buildings in the sanitary engineering section. In the original draft of his report he proposed the following: That the inspection of plumbing should be under the jurisdiction of a building commissioner or building department and not under the jurisdiction of a health department, for the reason that plumbing had nothing to do with the condition of public health; that the use of vents in plumbing be eliminated, and that the use of anti-siphon traps be encouraged. While the recommendation in his original report was not quite as sweeping as appears on the face of this synopsis, it nevertheless contained an element in contradiction to principles which we know to be sound because of experiences.

The adoption of such recommendations by an association of such national scope as the A. P. H. A. would most assuredly be given widespread publicity and would be taken advantage of in every small town, in every rural district and in every other place where cheap plumbing is sought. The term "cheap" is used advisedly and applies to the man who would unscrupulously install that which he knew would not give satisfaction, which would not meet with the requirements of the best practices, and would eventually prove a source of danger to the health of the occupants of the building in which it was installed and would most certainly under any condition be a source of nuisance.

Two of the members of this committee, Mr. Groeninger of Ohio and Mr. Carson of New York, went over the report with Mr. Wells and induced him to agree to changes in its form. When I met them in Washington at noon on the 18th inst. they had already made progress with him, and in a further conference that afternoon they explained to him that I was in town and went more deeply into the proposed report. The result was that a report was presented, signed by the majority of that committee, including Mr. McCrudden of Philadelphia, which advocated the ventilation of plumbing systems and declared against the use of anti-siphon traps, and in every respect sustained the theories and practices now in vogue in the best cities in the country. The report was presented, accepted and the committee continued for another year. It was considered of such importance by the members of the sanitary section that they desire a chance to consider its provisions so that they can intelligently discuss the recommendations at the next annual meeting. There are many prominent engineers in this section of this association. None of them wished to go into the details necessary for a plumbing ordinance, for example, but they do wish to see a standardization of terms and of general practices as well as of materials. It is believed that the same committee will be continued next year with possibly the addition of one or two other names.

Very truly yours,

THOS. J. CLAFFY,
Assistant Chief Sanitary Inspector.

Chicago, Ill.

coal man and the doctor, all of whom exist because they want to oust the sanitary and heating engineer out of business, by shirking their common duties on the one hand, and on the other hand loading up the building departments and architects with duties the latter know nothing about and care less there is little to choose.

The accompanying report from the deliberations of the American Public Health Association shows that the medical men are desirous of handing the sanitary engineering work over to architects and builders.

Why in the name of common sense cannot the medical men and sanitary engineers reason these matters out and have a medical department and mechanical department under the one head? Why not include in the latter department a heating and ventilation department and make houses and buildings better and more sanitary as well as more comfortable? This has got to come, and the sooner we face the issue the better it will be for all concerned. The sooner the owner is consulted about what is the most economical and healthy in the long run the sooner will he appreciate the work of the sanitary engineers.

The reason why there is so much repair work is because of the fact that poor work and material was in the first place installed. No one ever requires to pay heavy repair bills when a job has been done by a well tried and proved practical man. And it is not these men who are trying to repeal by-laws. It is the jerry builder, the architect, the unpractical faddist such as inventors of auto-syphonic traps. "There ain't no sech animile" and never will be under all conditions. We do not mean to say that there are no traps that resist syphonic action to a greater degree than others. But where so-called anti-syphonic traps are allowed there is need for a practical by-law. It is painful to see advertisements claiming that such and such a trap is an anti-syphon trap, because every practical man knows that such a contrivance is just as impossible and unpractical as perpetual motion.

We would ask our readers to turn to the first paragraph in the panel referred to and consider those works of Mr. Wells in which he stated: "That the inspection of plumbing should be under the jurisdiction of a building commissioner or building department, and not under the jurisdiction of a health department, for the reason that plumbing had nothing to do with the condition of public health."

Just imagine any sane man having the audacity to try and back up such a misleading and silly statement. But as a matter of fact Mr. Wells backed down and his recommendations were shattered.

So in conclusion we would urge upon both the trade and the manufacturers to do all in their power to guard their local plumbing by-laws, and to strain every nerve to oust the jerry builder and bulk contractor from their lair. The public's health and wealth will be so much more conserved.

Uniform Heating Code or By-law

At No Distant Date This Question of Heating Codes or By-laws For Towns and Cities Will Have to be Grappled With—We Would Like Our Readers to Send in a Few Suggestions

To Editor of Sanitary Engineer:

AS you have asked for expression of opinion for some form of ordinance or code for the proper installation of heating systems, I am glad to give mine, but will confine myself just now to the much abused warm-air system.

I have often watched the building of homes and have been greatly impressed with the amount of inspection given sewers, plumbing, electricity, gas jets; but when it comes to the furnace or heating plant, any old thing installed in any old way can be used in spite of all the instructions and efforts to the contrary.

Unfortunately it has not been felt that there is the same need to have the arbitrary power over the installation of heating systems as over the installation of drainage, plumbing, electricity, etc.. In the past whatever supervision heating installations have had seems to be in the interest of the insurance companies rather than in the interest of warming the building properly. Every precaution for the preservation of life is justifiable, and more interest should be taken in the health and comfort of those who occupy the building. We should insist upon the installation of warm-air risers to the different rooms of right shape and of sufficient capacity to allow the warm air to flow in to do its work at a much lower temperature than it can if the space between the studding in lath-and-plaster partitions is to be utilized for the warm-air conduit. The overheating of the furnace customary with such risers has caused the furnace to wear out in a comparatively short time, and has entailed the consumption of a much larger quantity of fuel than was really needed to warm the building if it had flues of proper size and shape and yet without satisfactory results.

A proper building code and the inspection of the furnace work by a competent city official, it seems to me, would insure to the average purchaser of a heating system better work and a more satisfactory job, to say nothing of the benefit that would come to furnace manufacturers in the increase of sales through the satisfaction attending better installation. The inspection of heating systems should be regarded by manufacturers not as a selfish move but as a protection which every city or town owes to its citizens. It is surely time for manufacturers and heating contractors to unite and work hand in hand in the production of a code of regulations to insure an installation that will be attended with satisfactory results, the fact that the installation work has been done for years without regulations or inspection is responsible for the character of much of the work done, and is the best evidence that there is a need for such.

Is it not possible for the manufacturers of the different forms of heating and the organizations now existing of heating contractors and city officials to get together and start a movement with a view to securing the protection that the heating industry seems to need and which would benefit it?

Yours truly,

Toronto. DAVID MILLAR.

NEW REGULATIONS FOR THE OPERATION OF STEAM BOILERS

At the last session of the legislature of the province of Saskatchewan the boiler code was amended, changing the system of collecting fees for the inspection of portable and traction engine boilers.

Owners of these boilers are now required to register them with the Department and to pay an annual license fee of $5.00 for each boiler.

On receipt of the above fee the Department will issue a number license plate which must be attached to the boiler, and after the 1st of January, 1918, no portable or traction engine may be used or operated which does not display thereon the numbered license plate for the current year as prescribed by the Act, under a penalty on summary conviction of not less than $10.00 and not more than $50.00.

Where the owner of a portable or traction boiler has already paid to the Department the annual fee for the current year the inspector will not charge any fee for the inspection of such boiler.

THE EXPERIMENTAL PLANT AND SANITARY ENGINEERING SERVICE

"At the experimental plant of the Provincial Board of Health problems arising in connection with sewage disposal and purification of public water supplies are studied. Units of appliances, such as mechanical slow sand filters, sewage tanks, sludge plants, etc., are established and their capacities and values tried out. In this way the board through the engineer is able to offer expert advice to municipalities proposing to erect a water purification plant or a sewage disposal works. For all of these works plans, specifications and an engineer's report are required by law to be presented for approval of the board. If the plans are faulty, too expensive, inadequate or unsuitable for the work in hand they are checked up by the board's engineer and the municipality is often saved considerable unnecessary expense and trouble.

"The volume of work of this character is bound to become very extensive in Ontario. In a recent year upwards of four million dollars' worth of work of this character passed through the hands of the board."—Public Service Bulletin, Province of Ontario.

Ventilation as Factor in Factory Output

The System of Heating Best Adapted For the Shop is Frequently an Important Question, and in the Following Article Various Systems Are Described

(Reprinted from the "Michigan Manufacturer")

SINCE science has become the coword of management much time and thought is being given to the "man element" of production. Never before has the sociological aspect of man development attained so high a point on the curve of importance as now prevails. Ventilation is one of the momentous considerations in connection with man output.

The system of heating best adapted for the shop is frequently an important question. There are all kinds of methods —some good, many poor, and a large number positively bad. It is not my intention to analyze the merits and demerits of the various systems, but to point out the advantages obtainable with a good system of heating, and to explain how it should be laid out, installed and operated to secure the best results.

A good heating system is quite as essential to the success of any manufacturing plant as good materials, good tools and good light. Employees cannot work at their highest efficiency when uncomfortable; neither will high-grade mechanics stay in a shop which is poorly equipped where there are other shops having modern conveniences for their comfort. First-class work can only be turned out by first-class mechanics. If they cannot be obtained, the natural result is disorganization, a poor grade of mechanics and inferior output. Even if experienced mechanics can be retained, they cannot put forth their best efforts, either in thought, carefulness or speed, if the atmosphere is impure or the temperature uncomfortably warm or cold.

Influence on Output

There are instances arising every day which prove conclusively that the heating plant has a positive and direct influence on the quality and quantity of the output. It does not require exceptional abilities for observation or analysis to discover this. Which plant is it that grows the faster—one with poor and antiquated equipment, or one which has everything up-to-date? Which one of the two would make the better impression upon you? Did you ever find salamanders or stoves in a pushing, growing, up-to-date plant?

Did you ever associate the shop conditions as you found them with the business done and the progress made? While the entire success of the plant cannot be attributed to the sanitary conveniences and the comforts afforded the men, yet it is a safe conclusion that the same management given a shop devoid of these things could not make the progress attained with them.

Those who recognize the advantages of a good heating plant frequently do not realize the necessity for designing it when the plans of the building are being made. The result is, that instead of arranging other things of much less importance to accommodate the heating plan, the latter has to be contorted, cut down, or squeezed into whatever space is available after everything else is taken care of. This makes the plant either expensive to install or to operate, and often it is so contorted or dwarfed in one way or another as to fail to give the satisfactory results naturally expected.

When it comes to laying out a heating plant, the character of the building and the purpose for which it is built must be carefully studied.

What answers for one type of building is totally unsuited to another of a different type. Again, what serves very nicely in a building of a certain type, in which a particular class of work is done, proves anything but satisfactory in a building of the same type, in which a different kind of work is done.

This can be made clear by comparing a machine shop with a paper mill. They are similar in size, shape and exposure. In the machine shop, no steam or moisture is emitted to condense on the walls and roof; hence many of them are heated in a fairly satisfactory manner by direct radiation. consisting usually of steam coils, strung around the outside walls. Such a system would never do in a paper mill, where every day several tons of water are thrown off into the atmosphere in the form of steam from the drying cylinders over which the paper passes. This steam must be taken up by a copious circulation of warm, dry air, or it will drip from the roof and run down the walls.

Again, in a shoe factory, shirt, glove, cap or other manufacturing plant where hundreds of employees are assembled in one room, the air very soon becomes unfit to breathe; it produces a dull, languid feeling, which saps all the vitality and ambition of the employees, makes them inert, forgetful, careless, subject to severe colds and other disabilities, all tending to make them irregular in their attendance to their duties. To overcome this, the building must be well ventilated, and the ventilation of a building in the winter time must be considered in connection with the heating system.

Foundries are much like the paper mills just cited, as the steam arising from the moulds when pouring off, as well as the smoke and noxious gases should be removed. Roof ventilators, monitor lights or ventilating sashes are very poor makeshifts indeed. Perhaps they will let some of the smoke escape and with it some of the gases and most of the heat; but most of the gases, being heavier than the air, lie in the lower strata near the floor and are not affected by the roof vents. Further, instead of removing the steam, they only accelerate the annoyance from it, as the warm air which escapes through the roof must be supplanted by outside air, and this, not being properly heated, chills the air within the building, thus reducing its capacity to carry moisture, thereby causing greater precipitation than there would be were no attempt made to ventilate the building.

Enormous Surface Exposure

Then, again, apart from the use to which the building is put, consideration must be given to its character.

The tendency nowadays is to put up lofty buildings. Such structures have steel frames, walls made almost entirely of glass, with only narrow pilasters between, and shallow panels of brick or concrete above and below the openings. The exposures are relatively enormous, requiring large amounts of heating surface, yet the space available for steam coils is limited to such an extent that it is often insufficient for the heating surface required.

Furthermore, when the space is sufficient, the banking of such great heating surfaces into a small space makes it uncomfortable for the employees who have to work near them.

It is these and many other features that have made the blower system popular, as it has proven efficacious in almost every building of whatever character when it has not been misapplied. Many of the designers of such heating plants sem to have a penchant for trying to make this system do all sorts of unusual and almost impossible "stunts." The system is so flexible and so positive in its action that many persons seem to think it capable of defying nature's laws. But occasionally nature asserts her rights in a most emphatic manner, with the result that a plant fails to do what was expected of it. This, however, is no fault of the system, but rather of the man who designed the plant.

The prevailing practice in industrial plants is to make the ducts of galvanized sheet iron for all types of buildings, except where it is necessary to place them underground, in which case they are built of brick, vitrified tile or reinforced concrete.

It is always advisable to run the ducts inside the building because of the heat wasted if they are run outside, be they above or below the ground. It is furthermore advisable to make the ducts of galvanized iron and suspend them in the open air overhead, if possible, as the loss of heat from underground ducts is enormous.

The average modern shop has a trussed roof, the bottom chords of which are of-

ten 30 to 50 feet above the floor. The ducts have to rest on these trusses and it is impossible to drive air from them down to the floor in a way that will produce satisfactory results. This method has been tried often enough, but there still remain others who must be convinced of its impracticability by trying it themselves. The only way to obtain an even distribution of heat is to discharge heated air at such points as it is most needed and where the effect will be most appreciated.

To distribute the heat evenly necessitates running the ducts to all cold spots, it is needed the most in the lower strata near the floor, not up among the roof trusses; the greatest benefit is derived from the system by discharging the warm air close to the floor, keeping the lower strata in circulation and thereby warming it by mixing with it the warm air discharged from the ducts.

Air Should Discharge Directly

The best way to bring this about is to extend the branch ducts from the main trunk line over the walls or to posts not more than twenty feet away from the outside walls, then down towards the floor, ending four or five feet from the floor. The air should discharge directly toward the floor or at only a slight angle from perpendicular. This method will be found most effective in machine shops, foundries and other lofty structures.

In paper mills, rubber works, dye houses and other plants for which the building is of the same type as those just noted, it is necessary to blow some hot air out towards the roof as well as down towards the floor, in order to take care of the condensation which would otherwise collect on the under side of the roof. Even then, in very cold climates, it is sometimes necessary to put in a false ceiling to overcome this annoyance, unless hoods are provided to remove the vapor immediately, and particularly if the roof is built of a material which is a good conductor of heat.

For buildings which are several storeys in height, each storey being from ten to sixteen feet high, the treatment should be different. With them it is possible, and sometimes advisable, to introduce the air near the ceiling, blowing downward at an angle of 30 to 45 degrees from horizontal.

Frequently buildings of this character are quite effectively heated from one or two galvanized iron stand pipes run up through the middle of the building with outlets into each storey. This method is practical in buildings not over sixty feet wide; if the building is not over 100 feet long one riser will be sufficient.

For cotton, woollen, silk and other textile mills, it has become almost the universal practice to build vertical warm air flues on the outside face of the pilasters, on both sides of the building. These flues usually have a two-inch air space built into the brick wall to insulate them. The air is admitted to each storey about eight feet above the floor. Deflecting "mill dampers" regulate the volume of air discharge through each opening. The various flues can be supplied at their base from a main built either of masonry or galvanized iron.

Velocity of Air Current

For manufacturing plants it is customary to make the trunk line ducts of such an area as will convey the required volume of air at a velocity varying from 1,500 to 2,400 feet per minute. In high buildings used for heavy and coarse work, where most of the employees stand or move about considerably, the velocity can be much higher than in shops divided into several storeys, or those in which the work is more or less sedentary, like the manufacture of shirts, gloves, etc., where the employees sit all day, simply feeding the material into machines.

Air currents or drafts are of no material moment in the former shops, while in the latter they will produce great discomfort. Therefore, the latter class should have the main ducts of sufficient area to keep the velocity down to 1,200 to 1,500 feet per minute and the branches should be proportioned to a velocity of 600 to 900 feet.

Another advantage the blower system possesses, infrequently brought to notice, is the cooling and comfortable effect it has in oppressively warm weather in the summer time. Simply running the fan will, of itself, greatly relieve the oppressiveness, and when cold water is circulated through the coils the difference is very noticeable.

There is often a wide variation of opinion as to the best temperature to maintain in cold weather. As a general proposition, in foundries and other buildings where the work is active and somewhat vigorous, a temperature of 50 to 55 degrees is sufficient. In machine and wood-working shops it should be from 60 to 65 degrees. In shoe, clothing and other factories employing help where the work is more or less sedentary the temperature should be 68 to 72 degrees.

TABLE I

Class of Building.	Temp. Desired Inside Outside 0°	Resulting Inside Temperature. Temp. Outside — 30°	Temp. Outside — 20°	Temp. Outside — 10°	Temp. Outside + 10°	Temp. Outside + 20°	Temp. Outside + 30°
Foundries	50	22	32	41	57	63	70
Machine shops	60	34	43	52	67	73	78
Clothing shops	70	45	55	63	76	81	86
Paint shops	80	59	67	74	85	89	92

The basis for determining the amount of heating surface is the most difficult point to settle. In northern climates the outside temperature occasionally drops down to 10 degrees below zero, and in Minnesota, Dakota and Montana it goes even lower than 30 degrees below zero. If a plant is designed for these extremely low temperatures it is too large for the conditions prevailing for 95 per cent. of the year. It therefore becomes a question of very fine judgment as to just what should be the basis upon which to figure. Table No. 1 will give a fair idea of what the resulting temperatures will be under the varying outside atmospheric conditions, the basis being zero.

From the table it will be noted that for climates where the temperature does not drop below —10 degrees an inside temperature based on zero outside gives very fair average results; but for climates where the temperature may be

TABLE II

0 to 10 degress	4 days at 24 hours per day= 96 hours	at 10 hours= 40 hours
10 to 20 degrees	10 days at 24 hours per day= 240 hours	at 10 hours=100 hours
20 to 30 degrees	34 days at 24 hours per day= 816 hours	at 10 hours=340 hours
30 to 40 degrees	61 days at 24 hours per day=1464 hours	at 10 hours=610 hours
40 to 50 degrees	48 days at 24 hours per day=1152 hours	at 10 hours=480 hours
50 to 60 degrees	53 days at 24 hours per day=1270 hours	at 10 hours=530 hours

Total hours at 24 hours per day=5040 hours; at 10 hours=2100 hours

from —30 to —20 degrees for several days at a time, the basis is not low enough. For such cases, if the basis is zero, the resulting temperatures should be figured about 10 degrees higher than normal or the temperature in the table given for machine shops should be taken for foundries and the temperature for clothing shops should be taken for machine shops.

On the other hand, if the coldest temperature ever reached is zero, and the protracted cold spells are usually at outside temperatures of from 10 to 20 degrees above zero, the basis for determining the size of the plant in zero weather would be 40 degrees at zero for foundries and then taking the tabulated temperatures of foundries for machine shops and the latter for clothing shops.

In this way considerable unnecessary expenses can be saved in the initial cost of the plant; it will be smaller and hence much less costly to operate. It is all well enough to argue that the steam can be cut down on the heating coils and the speed of the fan reduced when the weather conditions moderate, but this is usually not done, simply because it is nobody's business to see that it is done, and instead of thus economizing in the cost of operation, one will invariably find the shop windows and doors open wide when it becomes too warm inside. Therefore, the more nearly the size of the plant conforms to the needs during average weather conditions, the less it will cost to operate it, and this can only be brought about by settling first on what temperature will be satisfactory for the few days of extremely cold weather. This applies to any heating system and, if anything, should be given greater weight for any other than the blower system, as no other can be so readily adjusted to varying weather conditions.

With the blower system one or more sections can be cut out of the heating coils and the blower slowed down in moderate weather; or steam at a high pressure can be turned into the coils and the fan be driven at maximum speed for extremely cold weather.

Another question often arising, which is sometimes quite important, is the determination of the heating period within a year. An average from the records for ten years in this vicinity gave the results shown in table II.:

In a year of 365 days there are 8,760 hours. Hence, the heating period on a 24-hour basis is 57.5 per cent. of the total; on a 10-hour basis it is 24 per cent. of the total hours in a year.

If we multiply the hours by the degree rise, then on a 24-hour basis we get 180,500 degree hours, whereas multiplying the hours in a year by the maximum rise we get 606,500 degree hours. Hence, the heat required during the average heating period is about 30 per cent. of the maximum capacity throughout the year. Or looking at it from another standpoint, if we divide 180,500 (the degree hours throughout the heating period) by the total hours for this period we get an average of 36 degrees rise, which is 51.5 per cent. of 70 degrees rise for the same number of hours, viz., 5,040 hours. This is sometimes valuable information when figuring the cost of operating heating plants, as it gives a fairly reliable approximation of what it will amount to.

7th Annual Meeting of O.S. of D.S. & H.E.

A Good Attendance of Members Were on Hand—A Number of New Topics Discussed, and Additional Members Were Initiated—A Number of Splendid Reports

A meeting of the general executive committee of the Ontario Society of Domestic Sanitary and Heating Engineers was held on Friday, April 5th, 1918, in Room No. 503, Canadian Foresters' Hall, 22 College Street, Toronto.

President F. R. Maxwell called the meeting to order at 10.30 a.m.

Roll call showed the following members present:—

Directors—President: F. R. Maxwell; Vice-president: Fred H. Gentle; Treasurer: Thomas M. Maxwell.

Secretary—Garrett F. Frankland.

Honorary Directors—E. Lewis LeGrow, Ernest H. Russell, James R. Haslett, and A. E. Gibbons.

Trustees—E. H. Russell and Harry Mahoney.

Auditors—Jas. R. Haslett and Frederick Smith.

Chairmen of Committees—Heating: Ben Noble, London; Legislation: Angus McDonald, Stratford; Apprenticeship: Henry E. White, Brantford.

Vice-president—Clove R. Myers, Stratford, of the Canadian Society.

Messrs. John Eggett, Harry Aked, of London; Harry J. Peter, Fred J. Sylvester, of Stratford; C. R. Henderson, of Brantford; chairman John Wright, of Sanitary Committee of the Toronto Society, John A. Lillie, David Menzies, of Toronto.

On motion of Harry Mahoney and E. Lewis LeGrow, the minutes of the sixth annual meeting, as published in May 15th issue of THE SANITARY ENGINEER, 1917, were confirmed.

On question of Harry Mahoney as to the number of referendums returned, the secretary announced the receipt of seventy-six as being in favor of the general meeting of executive committee to take the place of annual convention of the society for 1918.

The president and directors' report was read by the secretary as follows:—

President and Directors' Report

Toronto, Friday, April 5, 1918.

Gentlemen and Fellow Members:—

On this the occasion of the seventh annual meeting of the Ontario Society of Domestic Sanitary and Heating Engineers, it affords me and my fellow directors great pleasure to welcome you once again to a meeting of the general executive committee of our society.

In the early part of the present year your directors considered the advisability of dispensing with the annual convention, and had forwarded to the members a referendum for their approval; a majority of these were returned as satisfactory, and we trust that our action in calling the executive committee will, therefore, meet with approval.

Our policy for the past year has been one of economy, and we are pleased to report a very substantial bank balance on hand.

The Provincial Plumbing Regulations have been furthered to completion by the Provincial Health Department, and we have much pleasure in stating that through the efforts of Mr. John Wright, chairman of the Toronto Sanitary Committee, the regulations will be placed before you for your consideration at this time.

The Workmen's Compensation Board have announced another decrease in our assessment for this year, and it lies with ourselves in the care we take with our work and the precaution to assure that our equipment is always safe and sound for the use of our workmen how much lower we are able to bring the assessment of our own group.

Our membership has remained at normal, though several have seen fit to withdraw, during the past year, all of whom we are sorry to see leave our ranks, but to E. H. Barnes, of Sault Ste. Marie, we all wish the best of luck in his new endeavors; also E. T. Needham, of London, who is retiring from business.

Several new members have been received into the Toronto committee, and while conditions seem to be most favorable for the society with the Toronto craft, we trust that improved conditions will prevail before long with the craft throughout the entire Province.

The question of Municipal Heating Bylaws have received some consideration during the past year, no doubt due to the scarcity of fuel. Your directors do believe that some action is desirable along this line, but note that the present Public Health Act, already includes the regulations of any heating or ventilation conditions in the homes or buildings of our municipalities.

The question of public comfort stations is one of great importance to our citizens and the Public Comfort Station Bureau of New York have supplied us with considerable data pertaining to their campaign for more and better public comfort stations. We believe each local committee would do well to consider this question.

We note with pleasure that one of our staunch members, in the person of Frank Rudow, of Elmira, had the endowment fund of the society in mind, and we express at this time the thanks of the whole craft for his generosity to that fund during the past year. That this is the source of perpetuating our organization os well known to all the members of the executive committee and to Trustee E. H. Russell, of London, goes the credit for the inception of this fund in our society. Trustee Russell has recommended during the year the appointing of another member on the board of trustees, and we have much pleasure in placing same before you at this time for your ratification.

The trade conditions as existing between our craft and the source of our supplies has been improved to some extent during the past year by an increased preferred trade discount being quoted by the heating interests. That we have not attained the ideal conditions we desired is to a large extent due to the unsettled trade conditions at present prevailing, and also

to a lack of co-operation on the part of the trade as a body.

The question of uniformity in re-sale prices for plumbing and heating material has received considerable attention and support by the trade throughout the Province during the year. Your directors consider that it is one of the avenues through which much good must accrue to the craft, its members and the general welfare of the public as well.

Respectfully submitted,
Directors for 1917:
(Signed) F. R. Maxwell, President
Fred H. Gentle, Vice-Pres.
Thomas M. Maxwell, Treas.

Messrs. Mahoney and Peter moved the receipt of the directors' report. Secretary read the financial statement for 1917, as follows:—

Financial Statement

The Ontario Society of Domestic Sanitary and Heating Engineers, for 1917. Year ending January 31st, 1918

RECEIPTS

1917—	
Feb. 1—By bank balance	$200.00
By dues received from secretary	640.00
By cash received from F. R. Blewett	56.83
Total receipts	$896.83

DISBURSEMENTS

1917—	
Feb. 1—To annual Government fee	$ 1.00
16—To F. R. Blewett, K.C.	10.00
June 14—To Fred Smyth, printing	12.25
25—To G. F. Frankland, exp.	25.00
Aug. 1—To Canadian society, per capita, 1917	92.00
21—To G. F. Frankland, exp.	50.00
Jan. 14—To G. F. Frankland, exp.	11.50
Total disbursements	$201.75
1918—	
Jan. 31—Balance in bank	$695.08
	$896.83

NOTE.—The receipts were made up as follows:—

1916 Balance	$200.00
Back dues	40.00
1917 Dues	600.00
F. R. Blewett	56.83
	$896.83

Liabilities

Special loan from endowment fund	$100.00
Special loans from members	160.00
	$260.00

Assets

Office furniture, charts, records, stationery and books, etc.	100.00
Bank balance	695.08
	$795.08
Gain	$535.08

April 5, 1918.

Audited and found correct.
James R. Haslett,
Frederick Smith

President referred financial statement to the auditors for their approval.

The report of the directors was taken up by the president, explaining the different clauses, and by the following action being taken thereon.

The executive committee approved the action of the directors in reference to the delinquent members, and adopted several suggestions as to the further action to be taken with those in arrears to the society for their dues.

Mr. Haslett, London, moved, and Mr. Myers, Stratford, seconded, that a letter of appreciation be forwarded to Frank Rudow of Elmira, from this meeting of the executive committee, for his donation to the endowment fund.

The question of uniform re-sale prices, as adopted in the Henderson Business Service was taken up at great length, and was referred over to the afternoon session, for further consideration, on motion of Harry Mahoney and Henry White.

Adjournment took place at this point until 2 p.m., for luncheon.

President F. R. Maxwell called the meeting to order at 2.15 p.m.

The chairman of sanitary committee's report was read by Secretary Frankland.

Report of Chairman of Sanitary Committee

Chatham, April 1st, 1918.

Gentlemen:—

As chairman of your sanitary committee, I beg to inform you that I have endeavored to have enacted in the city of Chatham the attached sanitary plumbing and waterworks regulation, based on the lines of the proposed provincial plumbing regulations, compiled by our society.

That these have not become operative is due to the fact that the provincial board of health have been drafting a provincial regulation, suitable to meet the conditions throughout Ontario, and it was thought advisable to await the action taken by the provincial health department, so that no confliction might ensue.

I wish to refer to Mr. John Wright, chairman of sanitary committee of the Toronto craft, who has been most active in furthering the enactment of the provincial regulations, and to whom we all owe a great debt of gratitude for his untiring efforts on our behalf.

Thanking you for the confidence placed in my ability, and wishing one and all continued good health, I remain,

Yours truly,
(Signed) R. McG. Coyle.

Messrs. Harry Mahoney and Clove R. Myers, moved that report be received. The chairman of heating committee's report was read by Secretary Frankland.

Heating Committee Report

Officers and Members of the Ontario Society of Domestic Sanitary and Heating Engineers:—

I wish to thank you all for honoring me as your chairman of heating committee, and while I admit the field is vast for many improvements in this sphere of our craft, I regret to say that I have very little to report at this time.

I would just repeat that if our members adopted a uniform hot water heating specification as was approved by the society some time ago, it would, to a great extent, improve competitive conditions on this class of work, and bring about improvement in the styles of our installations.

That we might consider the adoption of a recognized method for computing the quantities of radiation required in buildings for both water and steam work, as suitable to the different conditions found throughout the province.

The question of plans and layouts for heating installations, while one that has received considerable attention, might be considered as to the possiblity of having one central office from which to secure same upon payment of a fee.

Yours very truly,
(Signed) Ben. Noble.

Messrs. Harry Peter and Ernest H. Russell moved that report be received. The chairman of arbitration committee's report was read by secretary.

Report of Chairman of Arbitration Committee

April 1st, 1918.

Mr. President:—

I beg to inform you that once again I have nothing to report, as everything seems to be lovely. I do not see any use of me attending the meeting of executive committee, as I am very busy just now.

Hoping you will have a pleasant meeting and that everything will be O.K., I remain,

Yours truly,
(Signed) H. S. BROWN.

President Maxwell recommended the receipt of this report. The chairman of legislation committee's report was read by secretary.

Report of Chairman of Legislation Committee

Gentlemen:—

As chairman of your legislation committee, I wish to convey to you my appreciation of the honor you have placed on me, but regret that I have been unable to actively associate myself with the affairs of my office.

I noted with great pleasure that the regulations were amended as to the qualifications of a master and journeyman plumber for the province of Ontario, and that a distinction has been made in the two branches of the craft.

That we have to thank the Toronto craft for this legislation just goes to show what can be done if our craft will only associate themselves one with another in the interests of their own and the public welfare.

Trusting that our members will overlook my negligence on their behalf, and assuring all the best wishes, I am,

Yours truly,
(Signed) ANGUS McDONALD.

Report was received on motion of Messrs. Harry Mahoney and Fred Sylvester. The chairman of apprenticeship committee's report was read by secretary.

Report of Chairman of Apprenticeship Committee

Brantford, Ont., April 4th, 1918.

To the Officers and Members of the Ontario Society of Domestic Sanitary and Heating Engineers:.

Gentlemen:—

ELECTION OF OFFICERS FOR 1918-19

Motion of E. R. Russell and Clove R. Myers that the present directors and officers retain their respective offices for 1918.

Directors

F. R. Maxwell, president.
Fred H. Gentle, vice-president.
Thomas M. Maxwell, treasurer.
Garrett F. Frankland, secretary.
1093 Bathurst Street, Toronto, Ont.

Honorary Directors

E. Lewis Le Grow,
Harry Hicks,
E. H. Russell,
Wm. Mansell,
Geo. Clapperton.
James R. Haslett,
A. E. Gibbons.

Auditors

Geo. Ross, Brockville.
James R. Haslett, London.
Frederick Smith, Guelph.

Trustees

Ernest H. Russell, London.
Harry Mahoney, Guelph.
Garrett F. Frankland, Toronto.

Chairman of Committees

Sanitary

Robert McG. Coyle, Chatham.

Heating

Ben. Noble, London.

Arbitration

H. S. Brown, Brockville.

Legislation

Angus McDonald, Stratford.

Apprenticeship

Henry E. White, Brantford.

Educational

George E. B. Grinyer, Guelph.

Examination Board

The directors.

As your chairman of apprenticeship committee, I beg to report progress for the past year. As you all must realize the question of help and labor is one of the keenest propositions that we are contending with to-day, due entirely to our present war conditions.

Our apprenticeship problems are likewise of a serious nature, and they become more so day by day, because all the available material is required to take up its part in the big question being settled over there.

I would nevertheless suggest to this meeting that the question of the mechanics of to-morrow for our crafts be taken up at this time, and if possible some suggestion made to the members about the province, for their co-operation, in having lads apprenticed to serve an apprenticeship at the plumbing or heating.

Thanking the members for their past confidence in me, and with a wish of having our craftsmen continue to excel in their line, I remain,

Yours truly,
(Signed) HENRY E. WHITE.

The president recommended that this report be received. The chairman of educational committee's report was read by secretary.

Report of Chairman of Educational Committee

Guelph, Ont., April 4th, 1918.

The Ontario Society of Domestic Sanitary and Heating Engineers.

Gentlemen:—

As chairman of the educational committee I feel that I would be delinquent in my duties were I to hesitate to recommend most strongly to the trade in general the use of the "Henderson Business Service."

It has proved so satisfactory in use in our store, and is a continual source of both pleasure and profit, that I feel confident as to its usefulness to any of our fellow craftsmen.

The very fact of being able to give quotations to an enquiring customer and know, without looking up invoices or lists and discounts, that your quotation provides for overhead expense and profit, is quite enough, to my mind, to remove any feeling of hesitation as to its advisability. Then, should prices advance—presto—the change is made in the price book with hardy any effort on your part at all—simply change the loose leaf and you are at once up-to-date. Again—the discount arrangement, under different classifications, to fellow contractors, removes to a large extent the temptation to borrow, for when the borrower is billed for the article less 20% to 25%, according to the list, he pays the overhead expense of the lender; this in itself is worth all we pay for the service.

Why should we grow grey-headed before our time, worrying over discounts and old quotations? Let Henderson do it.

I would urge the adoption by this executive of a resolution to endorse the "Henderson Business Service."

Yours very truly,
(Signed) GEO. E. B. GRINYER,
Chairman.

Messrs. Mahoney and McDonald moved that report be referred to directors. Trustee Ernest H. Russell reported that the trust fund showed a bank balance of ten dollars and thirty-one cents ($10.31) on October 31st, 1917.

Trustee Russell further recommended that the trustees of the endowment fund be increased to three in number so that at all times there would be two available to satisfy the bank requirements if for any reason one or other of the trustees was not to be secured.

On motion of Angus McDonald and Clove R. Myers the suggestion of Mr. Russell was adopted that there be three trustees appointed for the endowment fund, and that the third one be the secretary of the society. President Maxwell instructed Secretary Frankland as to his added duties as one of the trustees.

Secretary Frankland read communications as received from President Charette and Secretary-Treasurer John Watson of the Canadian Society of Domestic Sanitary and Heating Engineers, and the Canadian Manufacturers' Association which upon motion of Jas. R. Haslett and Angus McDonald were received and to be replied to by secretary.

Mr. James R. Haslett presented report from the auditors as follows.

Auditors' Report

Toronto, April 5, 1918.

To the Officers and Members of the Ontario Society of Domestic Sanitary and Heating Engineers.

Gentlemen:—

Your audit committee have audited the books and vouchers of the society for the year 1917 and have found the same correct and neatly kept. We would suggest, however, that the secretary should in future take a receipt from the treasurer when paying over moneys to the treasurer. Also that the secretary should have his books signed at the end of each year's record by the auditors.

All of which is respectfully submitted.
(Signed) JAMES R. HASLETT,
FREDERICK SMITH

Messrs. E. H. Russell and Harry Mahoney moved that the report of auditors be received and the suggestions therein contained be carried out by the directors. The meeting adopted the motion.

On motion of Clove R. Myers and Angus McDonald it was approved that the loans made to the society by the members in 1915 be refunded to the members making same, excepting special cases cited, if the finances will stand same.

On motion of E. H. Russell and Harry Mahoney it was approved that the loan made to the society by the trustees from the endowment fund in 1916 be returned with 7% interest.

The following applications for membership as received by the Toronto committee were passed upon satisfactorily on motion of Harry Mahoney and Frederick Smith. Certificates and constitutions being granted as follows:—

No. 226.—John H. Gowan, 338 Gladstone Ave., Toronto.

No. 227.—Harry A. Weinraub, 291 Broadview Ave., Toronto.

No. 228.—Charles C. Ormsby, 204 Pacific Ave., Toronto.

No. 229.—John D. Smith, 425 Euclid Ave., Toronto.

No. 230.—Lou Palter, 621 College St., Toronto.

No. 231.—Wimpenny & Byrne, 59 Boon Ave., Toronto.

The withdrawals of Messrs. C. F. Needham, London; L. Gies, Dundas, and E. H. Barnes, Sault Ste. Marie, were approved, as reported on by directors.

The provincial plumbing regulations were placed before the members by Mr. John Wright, chairman of sanitary committee of the Toronto society, and considerable discussion took place in reference to same, to all of which Mr. Wright most ably explained the conditions pertaining in same.

Mr. James R. Haslett moved and Mr. Clove R. Myers seconded a most hearty vote of thanks to Mr. John Wright for the able and generous manner in which he has attended to the affairs of the craft, and to the regulations in particulars.

President F. R. Maxwell declared that the pleasure was all his in tendering to Mr. Wright the vote of thanks, and assured Mr. Wright that in the word thanks went all that possibly could be included in any further remarks that he might make.

Mr. Wright in reply stated that to him would come the pleasure in knowing that his fellow craftsmen in the days to come would have all the benefits possible to secure as a profession, and thanked one and all for their appreciation of his efforts.

The Sanitation of Factories

An Address Read at Last Annual Meeting of Association of Medical Health Officers of Nova Scotia and Reprinted From the Canadian Public Health Journal Contains Some Very Practical Points and Suggestions For Sanitary Engineers.

By Mr. Philip Ring, Provincial Inspector of Factories, Halifax, N.S.

IF I were about to address a meeting of those with whom I usually associate, it would be necessary for me to make some preliminary remarks leading up to my subject. This, of course, is unnecessary on an occasion like the present. Therefore. I will not waste any of your time with preliminaries. You will understand that I am not dealing with the subject from a professional viewpoint. My observations will be confined to the views of an ordinary layman, whose duty it is to observe the sanitary conditions of factories.

The subject, "Sanitation of Factories," may be briefly summarized as follows:—General ventilation, local ventilation, toilets, drinking water, cleanliness, washing accommodation, and a few other matters to which I will refer briefly. Any one of these phases of sanitation with its many sub-divisions or side issues could be developed into a lengthy paper, consequently you will understand that many important features of my subject must remain unnoticed.

Ventilation

The subject of ventilation in factories is, generally speaking, one of the most difficult connected with factory sanitation. While we have not in this province the great congested centres of industry,

nor the very large manufacturing establishments, that are so prominent in other places, nevertheless we have the problem of ventilation with us.

In dealing with the subject of ventilation in industrial establishments it is customary to divide it into two parts: general and local ventilation. General ventilation deals with the condition of air in a factory, while local ventilation applies to the removal at the point of origin, and before they have mixed with the air of injurious dust, gases, fumes, etc., generated during the manufacturing process.

The open window is, to a large extent, the only means of general ventilation. The cold draught from open windows very often causes the windows to be closed, thus preventing the admission of fresh air in that manner. Again, owing to the nature of some industries, windows must be kept closed on damp or wet days, as the moisture will affect the goods.

When the weather is warm enough to open doors and windows, nature may be allowed to do the ventilating, but when it becomes necessary to heat buildings, the subject of artificial ventilation must be considered. Generally speaking, in factories the question of ventilation seems to be how to provide fresh air in workrooms and remove the vitiated air during the season when doors and windows must be closed. With sufficient heating facilities and the use of window ventilators this difficulty could to a reasonable extent be overcome.

It is an unfortunate fact that most employers do not give the subject of artificial ventilation the attention its importance deserves. Factories are erected without giving any consideration whatever to the matter. Eventually finding that some means must be employed to cool an overheated workroom or to remove some noxious gas or fumes, an open propeller fan is installed at a window, and the last condition is worse than the first. The dust or fumes from some machine or other process of manufacturing is drawn, often from the opposite side of the workroom, past the breathing level of the workers, with the results which will be apparent to you. Another objectionable feature of the open fan, when its installation is not properly considered, is that the large volume of air exhausted must be replaced and this replacing air will rush in through any opening, such as doors, windows, elevator shafts, etc., causing such a draught that the fan must be stopped. Were the time at my disposal I could continue to discuss this question of open fans almost for the whole time of your meeting, but it can be said that employers have wasted considerable money, and workers have to contend with unhealthful conditions, because an expert was not consulted when factories were being erected or when artificial methods of ventilation were being installed.

Heating and ventilation should be considered as inseparable if ideal conditions are to be attained. In many workrooms, in cold weather, a reasonable temperature is only obtained at the sacrifice of all ventilation. An ideal method of heating and ventilating known as the plenum system, which is intended to give a continuous supply of fresh air, is in use in a number of large industries. By this system the air is drawn through a heater by a fan and forced through air ducts to all parts of the building. The entering air is forced into the building under pressure in a constant volume, which must displace an equal quantity of air; hence the ventilation is positive if the system is properly connected with the outside air, similar to any ordinary hot air heating system in a house. Very often we find that the fresh air inlet is omitted, one side of the enclosure about the heater is left open, and the ordinary air of the factory with its impurities is drawn into the system and used over and over again. Thus what was intended for a heating and ventilating system is rendered useless so far as ventilation is concerned.

Local Ventilation

No industry is free from dust. As can be readily understood, it is a result or accompaniment of occupation. The importance of dust as a factor in disease and occupational mortality you will, of course, recognize. To remove dust or other impurities generated in the process of manufacture, the principle of local ventilation is applied; that is, an exhaust system devised specially for their removal locally at the point of origin, thus preventing them from mingled by branches with a main duct, and an exhaust fan draws the material to be removed through the branches and duct and deposits it in a separator or dust chamber. As in the case of open fans, already referred to, there has been considerable disappointment in the construction of exhaust systems. Many persons think it is a simple matter to design a proper dust-conveying system. In reality there are a number of points which require careful and intelligent handling. Various considerations enter into almost every case to determine the proper arrangement of the hoods and piping, so that it is impossible to lay down any hard and fast rule. Indeed, it should be stated here that the design of such a system, and the various problems arising in its installation, should be referred to those whose previous experience in such matters place them in a position to provide a successful and economical system.

A large number of these exhaust systems are now in use in this province. Such a system is used to remove the fumes from the lead pot of a type-setting machine as well as the smoke and gas from a furnace. It is operating in every woodworking factory of any importance to remove the shavings and sawdust from the machines. Grinding and polishing wheels are equipped with this system. Ropeworks and foundries are using it. In fact, the system can be made useful in almost any industry.

The relation of industry to mortality has been the subject of careful and exhaustive investigation by medical experts in all industrial countries, and your own experience will no doubt agree with their conclusions that the high death rate from pulmonary diseases among industrial works is due largely to the inhalation of dust, fumes, gases, etc., incidental to their occupations. The figures which some of those investigators give, when comparing the death rate from certain diseases between factory workers and those employed in the open air, are such as to emphasize the importance of local ventilation.

Ventilation of factories is a most important phase of sanitation and should receive the careful attention of those who are engaged in the conservation of public health. It is a fact that most workers do not notice the bad condition of air in a workroom. Even the presence of gas or some other noticeable impurity is not often detected except by a person coming in from the outside air. After all the human element is the important factor, and improvements will not move much faster than the development of the workers' knowledge of the subject.

Toilets

Perhaps the most difficult subject the factory inspector has to deal with is the sanitary condition of closets. How to secure proper ventilation, plenty of sunlight, proper separation of the sexes, removal of closets from workrooms, and have them kept in a sanitary condition, are perplexing problems, when the situation, available space, and other circumstances peculiar to each case are taken into consideration. While we have many excellent examples of lavatory accommodation in our factories, we have also many establishments where the toilets are always in an unsanitary condition. It is unnecessary for me to dwell on this latter condition, only to remind you how much it may be aggravated when it occurs in a food-producing establishment. It may be asked, why is it that those unsanitary conditions occur? It is due mostly to faulty construction and also to the filthy habits of some workers. We have not in this province any standard requirements regulating the construction of closets. The plumbing in some localities must be inspected, but otherwise employers are at liberty to select the location and erect the closets to suit themselves, and it very often happens that even ordinary sanitary principles are neglected. If closets are erected in dark corners they will usually be found in an unsanitary condition. Darkness seems to invite carelessness. The question of light and local ventilation is not considered; in fact, it appears at times as if those essentials of sanitation were deliberately ignored. The material used in construction is not selected with a view to suitability. It cannot be expected that such places, even with care, can ever be kept in good condition.

Regarding the filthy habits of some employees, we will agree that it is a difficult problem to deal with, but it is being dealt with, and where the management has made a determined effort the trouble has been eliminated. My experience in those matters has been such that I am convinced, where closets are properly installed and given the care and

attention they require as a rule no fault can be found; where they are otherwise, it is mostly due to a lack of determined effort on the part of the employers.

If we are to make any substantial progress in this matter of toilets, we must have some standard regulations governing their erection, such as the following:

Water closets shall be readily accessible to the persons using them. The entrance to every closet which opens directly into a workroom shall be screened from view by a vestibule. No closet or urinal compartment may be maintained in connection with rooms in which food products are manufactured or wrapped, unless such compartment is separated from such rooms by a vestibule with doors. Every toilet room shall have a window opening directly to the outdoor air. Fly screens shall be provided for toilet windows when necessary. The floors of every toilet room, and the side walls to a height of four feet, shall be constructed of material, other than wood, which is impervious to moisture and which has a smooth surface. The outside partitions of every toilet room and of every closet not located in a toilet room shall be of solid construction and shall extend to the ceiling. There are a number of other requirements regarding the fittings, doors, partitions, etc., which deal with the moral as well as the sanitary requirements.

It will be easily understood by you that the occasional visit of a factory inspector will not be sufficient to enforce good sanitary conditions where the employers are not well disposed in that direction. It does appear that the health authorities, at least in the industrial districts, might extend their activities by occasionally visiting the industrial establishments.

Drinking Water

Most people now understand that the question of water supply for drinking purposes, and the method of supplying it, are very important phases of sanitation. There can be no doubt that the water which the employees of mills and factories drink in large quantities during warm weather has an important relaltion to their health and efficiency. While many manufacturers are very careful about this subject and adopt the best method to improve conditions, still it must be admitted that there are times when the drinking water in some localities is dangerous, and also that the common drinking cup is very generally used. However, the signs of improvement are encouraging. It is not uncommon now to meet workers who have their own drinking glass. Sanitary drinking fountains are being used in a number of factories, and there is evidence that their use will increase very rapidly. You will appreciate the sanitary benefits of the bubbler drinking fountain.

Further progress could be made in this matter if our law required that pure drinking water should be supplied, and where any doubt existed that it should be submitted to laboratory examination. The use of a common drinking cup should also be forbidden.

Cleanliness

Cleanliness appears to have various and widely different meanings and it is, therefore, a difficult matter to deal with successfully. Nothing is so unpleasant as to have to tell an employer that his factory is dirty. The statement is humiliating to the ordinary person, and employers as a rule resent it. Nevertheless it is necessary at times to remind some employers that their workrooms must be kept clean. There are many employers who really have a high standard of cleanliness, but there are also many who altogether neglect the most elementary sanitary methods. In the latter places all kinds of dust and refuse are allowed to accumulate on the floors, walls and windows; the workrooms swarm with flies in summer, utensils are badly kept and a general lack of cleanliness pervades the whole place. I said at the outset that this was a difficult subject to handle successfully. My meaning may be readily understood when one considers the task of persuading the proprietors of such places that they should clean floors, walls and windows regularly, provide fly screens for doors and windows, limewash occasionally, and otherwise put into practice the ordinary principles of cleanliness. The work of keeping places where food is manufactured in good sanitary condition can hardly be accomplished by a visit from the factory inspector once or twice a year. Such places should be visited at least once a month by the local health authorities, who should have special laws and regulations regarding them.

The spirit which prompts a man to lime-wash a machine shop and that which allows another man to neglect the most ordinary care of a workroom where food is manufactured will explain the widely different views mentioned in the opening paragraph of this subject. Law is not necessary to the person who is naturally inclined to be clean, and I am afraid its application is of doubtful utility in the case of those who are otherwise disposed. If the public who are using the products of those establishments would investigate the source of their supplies by occasionally visiting them, a better condition of affairs would prevail, as the surest way of reaching such people is through their pockets.

At some occupations the workers perspire freely and become very dirty. How necessary and how refreshing a good wash is for this class of employees before leaving the factory? Many factories have good washing accommodations. This law should authorize the factory inspector to order good washing facilities wherever he considers it necessary.

The pernicious habit of spitting, which is prolific of so much harm, is altogether too common in our factories. In work-shops it is said to attain its highest efficiency as a destroyer of public health. Employers should be compelled to provide sanitary cuspidors in factories. The efforts of health authorities are making a noticeable improvement in this respect. A few years ago the authorities at Truro, had cards about spitting posted in all the factories in that town. Employers informed me that their workers were being educated by methods of this character, and they would welcome any other cards or literature which would teach their employees to avoid this habit. It will be evident that where an employer keeps cards of this kind posted, he must, to be consistent, keep his establishment clean.

The use of artificial humidifiers in the textile industry is usually regulated by law. We have no such regulation in this Province, and it might be well if medical practitioners would note the effect on the employees of the two large industries when this system is in operation.

It would be very much in the interest of public health if it were possible to have persons suffering from a communicable diease removed from factories. We cannot say that such persons are not among the many employees of food or clothing producing establishments.

Conclusion

In conclusion I may say that while we have many deplorable sanitary conditions in some of our industrial establishments, there are also many employers who are giving commendable care and attention to the subject. There is, moreover, a gradual improvement every year, and among both employers and workers there seems to be developing a more intelligent view of conditions. We will continue to be handicapped in the enforcement of good sanitary conditions in factories until we have standard requirements or regulations governing many of the matters referred to. In dealing with the subject of ventilation, the English factory laws require that there shall not be more than 10 or 12 parts of carbonic acid gas present in 10,000 volumes of air. The inspectors are provided with apparatus for taking samples of air, and if the amount of carbonic acid gas in the sample taken exceeds this proportion the employer is notified that he must improve the ventilation. Different factory laws make provisions for the removal of dust, gases, etc., by exhaust systems, and specify a tests by which the efficiency of a system can be determined. Some laws deal with the subject of light, and prescribe a certain window space per area of workroom, and also prohibit the use of any but plain glass in factory windows. The question of temperature, humidity, washing accommodations, drinking water, cleaning walls and ceilings, and other sanitary matters are usually subjects of standard regulations. The tendency of modern factory legislation is to remove all doubt or argument by specifying, where possible, just what is required. We will agree that there is such a thing as having too much law, but we can always use common sense, and after all reasonable means have been exhausted the law is a very useful lever.

We are living in an age when it is admitted that the best index of a company's ers. Consequently, anything that makes

(Continued on page 48)

Sizes of Soil, Waste, Drain & Vent Pipes

How Shall We Compute Sizes of Soil, Waste, Drain and Vent Pipes?—Is the number of Fixtures on a Stack of Any Importance? — Some Very Revolutionary Theories Set Forth Which Deserve Serious Consideration

By Horace Nixon.

LONG before buildings attained their colossal height of now-a-days, plumbers began to be troubled with, amongst other things, the waving-out of the contents of traps by compression, and the reverse action of syphoning out by the disturbance of equilibrium caused by the rarefaction of the residual air of the stacks and branches in the immediate vicinity of the traps.

For some years before these forces were noted it had been the custom to extend soil pipes to the roof and to vent the highest parts of all branches to carry off the gases so that they would not corrode the pipes and it was thought that the enlargement of these vent pipes would prevent both syphonage and compression so the anti-syphonage pipes were started in three inches from the lowest soil branch, and with short two-inch branch vents from every closet and slop-sink fixture and were returned back, above the highest fixture branch, into an enlarged continuation of the soil pipe, which was continued as a vent to the roof.

It was found, however, that even now everything was not well with the plumbing system, and in searching for remedies Steven S. Hellyer of London, England, who was the greatest practical sanitarian of the nineteenth century, used an anemometer to measure the air sucked-down into stacks (of about 150 feet vertical height) by the discharges of the various closets attached thereto, and I find on working out his records, whilst preparing this paper, that the registrations of the anemometer, after due allowance for spin approximate pretty closely to the capacity of the soil pipes and drains through which the discharges passed, thereby confirming the theory propounded by me in my former paper that a man who properly understands the mechanics of plumbing can calculate to a nicety what sized pipes must be installed to protect the water seal of the trap of any fixture in any certain circumstance. And each trap fixed under a different condition will have a different requirement, hence the futility of stating that any certain trap must have a revent of a certain size, and that a certain number of traps of a certain size must have a certain sized vent. Hellyer, before his death, had arrived at and published his conviction that the main vent pipe should be at least the same size as the soil stacks for high buildings, and he was then referring to buildings of not much over 100 feet.

Now height has more to do with the matter of air relief in soil and waste pipes than the number of fixtures, and most plumbing bylaws recognize this fact, but wrongly specify larger soil stacks for buildings of over a certain number of stories or vertical height, irrespective of the number of fixtures therein, entailing thereby needless expense to the owner and endangering the working of the installation, to say nothing of providing an unnecessarily large area of soiled surface pipe to poison the surrounding air.

But, you may remark, Mr. Reader, I have thrown doubt on the efficacy of computing plumbing pipes by the number of fixtures; how then shall we calculate the sizes of soil, waste, drain and vent pipes?

On a large or high building one must locate all one's fixtures, grouping them as nearly as possible and then, given a man that has sufficient knowledge of mechanics and mathematics, together with a thorough practical as well as theoretical knowledge of plumbing and the axioms underlying the passage of fluids and semi-fluids through house-pipes, have him work out the individual requirements of each stretch of pipe. The expense of these calculations would be saved a hundredfold by the economy that would result, the better working of the installations, and the reduced maintainance costs, which would be about 25 per cent. of the average.

Has it ever occurred to you, Mr. Reader, that we should have smaller stacks in high buildings than in lower ones, or that the lower portion of a stack in a high building should be reduced in area?

If you were feeding water to a building of ten stories from a tank at the top would you use the same sized main service pipe all the way down, or would you not reduce it several times on the way down?

Why is this? The reason is that as you come down, as the practical plumber puts it, the pressure goes up, in volume, that is, and you get greater velocity, and therefore efflux on the bottom floors, though using a smaller pipe. Is this property not accentuated in the discharge through a vertical soil pipe? Gravity is getting in it's work with only the very slightest hindrance of the friction of a wetted perimeter on a falling fluid, or mixture of fluids, and that is practically negligible, given a six-inch stack in conjunction with a two-and-a-half inch discharge, which is all we get from most of the closet bowls in use in this country.

In a very high stack of a large diameter the discharges, long before reaching the ground level are partly vaporized and the air driven up the vent pipes is fully saturated. Now the many joints and branches of the soil pipe may contribute to this vaporizing, but the air resistance is, I fancy, the greatest factor, and we must remember that the more moistful the air the greater it's weight and the harder to drive, especially against gravity; I believe it is owing to this saturation that the air would rather push it's way through the water seal of a trap near the base of a stack than flow upwards, especially in a compressed state through a vertical vent pipe.

In dealing with the problem of venting soil and waste pipes it is necessary to distinguish the difference in the properties of air and water. Water is practically incompressible, and in a vertical pipe moves in a column almost equably throughout its length. Air, on the other hand is elastic and is either attenuated or compressed considerably before moving freely, and so it moves in waves until the whole column has been started. Allowance has to be made for this property of air in apportioning soil and soil vent pipes before we will perfectly overcome the disturbance of trap seals in high buildings.

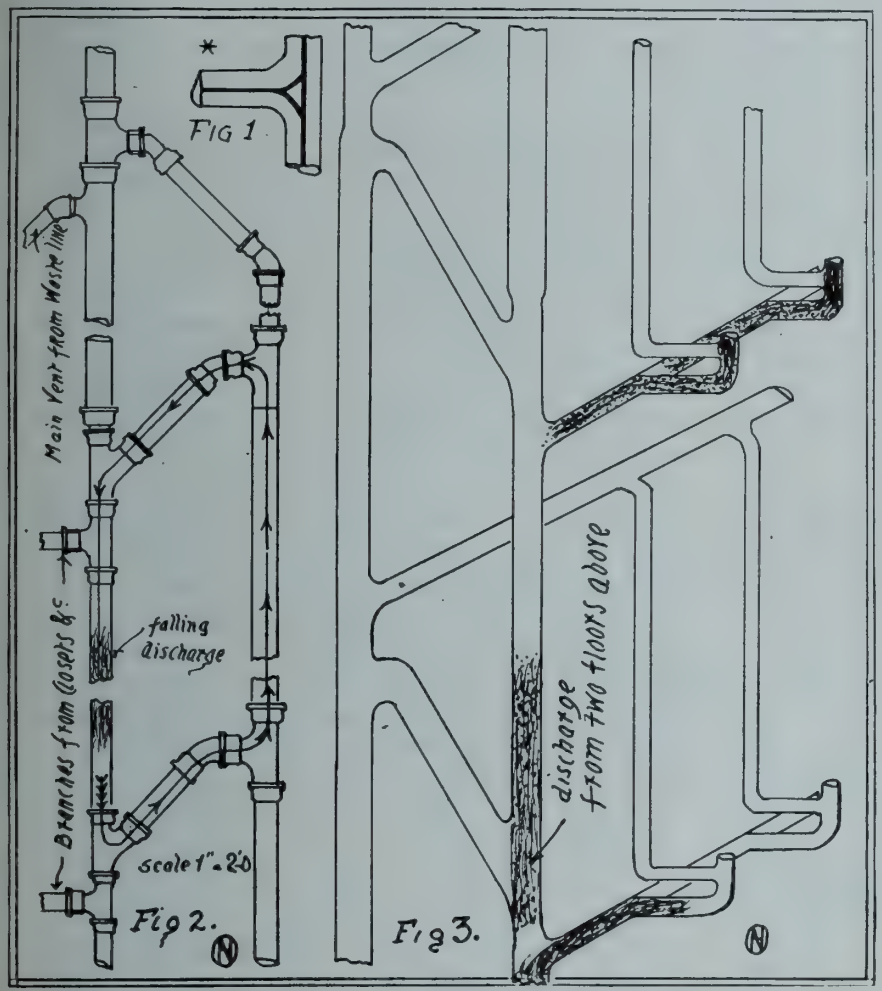
I have always been one of those who advocated the return of all vent pipes, where at all possible into the main stack above the highest fixture, principally for the reason that the falling fluids may pull some of the residual air through the vent stack and thereby help to relieve the compression at the lower end of the main vent by in some slight measure setting the column of air in the vent pipe in motion.

But compression is not the only factor we have to deal with in relation to the harnessing of air in vent pipes.

Attenuation is another property we have to allow for and guard against, and it is even more deadly in its consequence of upsetting the equilibrium of trap seals. When the loss of pressure is on the outer or local side of the trap, and the contents of a trap are syphoned out they cannot fall back into the trap as they may partly do after being waved out by compression, and we have this condition, that, instead of a more or less small gulp of sewer air escaping for a few seconds, sewer air is free to pass out of the emptied trap right along until such time as the fixture is again used and the trap so recharged. In the case of a wash basin fixed in an office, as so many are, this may be several hours, and may go on from six at night until noon the next day, by which time the air of that chamber would be pretty bad to breathe, though it might, if burned, heat the room.

In June, 1915, you published "An Address on Soil Pipe Fittings," by Jas. Marr, of Calgary, on which I started to prepare a criticism, which I was unable to finish in sufficiently good time, and abandoned it.

Although there were some things in the article and the very good illustrations that were contrary to my beliefs, there were also some excellent truths, which go far to stimulate my fancy that while the university men are playing with parabolic curves of effective intervals the practical men wil go ahead and solve the problems, if they are allowed to. In very forcible language Mr. Marr takes hold of the trouble of the T Y which he proceeds to remedy, not by the ineffective method of lifting the toe, but by taking the toe right away and substituting an upward curve to correspond with the downward curve.



When the branch was short, these were o ten made from one piece of lead and the fillet consequently seamed on an side only H. M.

In other words he makes a branch of a similar form to the old hand-made branch with the inserted fillet; those were the days when the plumbers made their own pipes, bends, traps and branches out of sheet lead and soldered them together with a copper bolt. I show one of these branches in Fig. 1. It consisted of two inner halves of bends, a straight half pipe and a fillet piece on each side, the heavy lines represent the soldering. For the past five years that we have been using continuous venting in Saskatoon I have opened the ends of all my stubs, where jointed into the vertical pipes upwards and downwards in this fashion, and I doubt not that the little extra time taken has been paid for by the saving in solder as there is plenty of strength without extra cleaning. Now Mr. Marr did not put sufficient stress on the benefit to be derived from this modification of the T Y; it's function in restoring atmospheric pressure to the wasting side of a trap before the designed water level is reached is inestimable. iHs idea of providing a bypass to the main vent in the same fitting is very cute, though it would not be necessary on every floor with single closet branches, and it appears to me they would be better were they attached to the main vent in a horizontal direction so that the air would take it's natural eddy and would so take care of the air that is being driven down the stack through making it go back by a short cut to the place when it was forced. My rough diagramatic sketch, Fig 2, will illustrate my meaning as will sketch 3 my assertion that it is not necessary or desirable to have such large soil pipes. Our new bylaw in Saskatoon calls for a 3-inch soil pipe for a four fixture job, the stack however to be increased to four inch below where the vent pipes are led back into it and so continued to the roof. A trial job on these lines has been working in the house of one of our Saskatoon employers since the early summer of 1914 with good results; the bath waste is also wet-vented by the washbasin waste. This recommendation was pressed upon the Edmonton convention of the Canadian Institute of Sanitary Engineers by the Saskatoon delegation, to whose committee I proposed it and had to fight pretty hard to get it adopted for recommendation.

The committee of "sizes of soil, waste, drain and vent pipes" at that convention found that they were unable to fix hard and fast rulings on those matters and so reported after a long session, and although they were continued in session for twelve months and added considerably to their number we were unable to bring in a different report.

The efficient working of the above-quoted installation however has warranted us in Saskatoon in the inclusion of this clause in our new bylaw of which Mr. Taylor, our inspector, has asked me to give you a resume in the near future.

VENTILATION UNNECESSARY

Under the above caption a very interesting though very much far fetched story appeared in a Toronto contemporary recently.

It is quite evident that the writer must have lost his bearings altogether, and it is surprising to see our daily papers allow their pages to be glutted with such nonsensical and dangerous stuff, or else he is one of those foolish employers who, in spite of expert advice given them, will build buildings with no provision made to furnish ventilation.

Mr. Munro may be able to juggle with statements so as to make them prove his assertions, but he has still to prove that those persons who live and work in well ventilated premises are less healthy or not more efficient in their daily occupation.

Ventilation Unnecessary

Editor of "The Star:" I have been surprised to see in recent issues of "The Star" quotation from the health bulletin and a lengthy communication from a sanitary expert giving elaborate directions for the ventilation of bedrooms. I had supposed it was now generally understood by those who keep themselves informed on health matters that the ventilation of bedrooms, especially in winter, was quite unnecessary.

Some years ago when a census was taken in one of the small European countries, Bulgaria, I believe, it was found that the percentage of octogenarians and nonogenarians was far above that of other countries. The matter attracted such interest that Government agents were sent out to interview all these old people, with the object of learning their mode of living. It was found that not one of them ever took baths or slept in ventilated rooms, two things which writers on health matters and doctors generally have always insisted upon were absolutely necessary for the preservation of health.

More recently exhaustive tests and experiments with air under various conditions and temperatures have been

Continued on page 37.

SANITARY ENGINEER

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VOL. XII. APRIL 15, 1918 No. 8

HE READS THE ADVERTISING

HERE'S something to think about: "I never miss a chance to read the technical papers. I read the advertising pages and all. In fact I read the ads. first."

Now, that's not a saying that was hatched in the brain of a man trying to sell advertising matter for a technical paper.

It is the opinion of a steel mill superintendent, who entered the business as an apprentice in a machine shop.

From apprentice he went to journeyman, to foreman, to assistant master mechanic, to master mechanic and on to superintendent.

And all the time he has studied and read the technical and trade papers, and studied the advertisements.

It simply goes to show that the technical and trade press is filling a place in the life of the mechanic that no other paper can reach.

It keeps him in touch with the latest developments in a field that is constantly being changed by new devices that may make the fit plant of to-day obsolete in a few years from now.

The advertising pages of the technical and trade press are as necessary as up-to-date text books to the man who intends to make a success of his occupation, no matter what that be.

A HEATING BY-LAW

THERE has been much discussion as to the need for some ordinance or by-laws that would create more uniformity in all kinds of heating installations. Without doubt there should be some laws governing such appliances, just as there are in the plumbing business.

It has been argued by not a few that to lay down any hard and fast rule would not be possible; that what one person wants as regards heat, the next man would not want.

As an example, one person would find 65 degrees ample for his comfort, etc., while another person would need 70 to 75 degrees, and it is stated that to try and make a person instal a furnace and heating system that would furnish 75 degrees when only 65 degrees are desired would be out of the question, and that such a law could never be enforced.

Very well then let us take another course. If a person builds a house for himself and the furnace will only heat the house to 65 degrees, the law should demand that the furnace should bear a cast iron or brass tablet or plate distinctly indicating the total capacity and heating power of the heating system. There are three reasons at least for a heating by-law being put into force.

First, to conserve fuel, and no one on this earth will try to prove that it is not time that we took more care of our natural resources, and particularly fuel.

Second, that the public should be told what a healthy temperature is and that both temperature and humid air are a matter of health and also that both elements should be under proper automatic control. The latter has a great deal of bearing upon the conservation of fuel.

Third, that the tenant as well as the buyer of a home or building should be given legal protection from the average bulk and speculative builder, the incompetent heating engineer, the real estate boomer and every one along the line whose only care is scraping for the almighty dollar.

It is all a matter of education with the average person. The one whose cry is that he only needs 65 degrees of temperature should be told that if a furnace and heating system is properly installed, and is capable of heating his home to 65 degrees without forcing the fire, that same system will be much more economical on fuel than if the system was only capable of giving a temperature of 65 degrees. And being convinced of those facts, he would become a strong supporter of such a heating by-law as suggested.

Next, the owner of property who draws rentals therefrom should be shown that when a heating system has been properly installed, inspected and endorsed by the local health authorities, and when it is easily operated and will heat the house or building economically, he in turn is better informed as to what rental he can procure or demand.

For example, the writer lived in two houses, for one he paid $40 per month, and the house was a fairly large size, well built and had a splendid heating system installed. It only required 6½ tons of coal to heat the house for the winter season. Later on he moved to another house because of the former being required by the owner.

The next house he only paid $35 per month for, but it required 10 tons of coal to heat it during the same period, although it was a smaller house and not as convenient as the former. Of course he moved out quickly, but there was a reason, the family were not comfortable, the furnace required more attention, it cost in the neighborhood of $40 more for fuel, and

wasted in actual fact 3½ tons of fuel, at a time when transportation was passing through a very acute crisis.

The only persons who could object to a heating by-law are the parasitic exploiter, the persons who live on the losses of others, whose only aim in life is to rob because there is no law to prevent them. So it is the duty of every sanitary and heating engineer to do his part towards compiling a real practical heating by-law, that can be slightly revised to meet local and climatic conditions.

It does not matter what kind of heating system is installed so long as it is capable of heating a building to a healthy degree and does not waste fuel.

GOOD FOOD FOR THOUGHT

THE article which appears elsewhere in this issue and the inspirational letter from E. Roy Belyea should form food for thought and be given the earnest consideration of every sanitary engineer worthy of the name. It is a somewhat remarkable coincidence that from two entirely independent sources should come the same idea of collective advertising to convince the general public that there exists among the plumbing or sanitary engineer fraternity a class of men as honorable and of as high integrity as exists in any other trade or profession.

It cannot be denied that in the past the members of the craft have been too prone to remain silent when attacks and aspersions have been made upon them. There has been a lack of *amour propre* on their part. They have been too willing to be regarded as on the same level with those botchers and inefficient workmen who have been instrumental in making the name of the craft a byword for incompetency and muddling.

Let all this be a condition of the past and let us all get together under the inspiration of such men in the craft as Mr. Belyea and once for all put an end to this reprehensible condition of affairs. Let us use our best endeavors to make every member of the craft feel that upon him personally as upon all of us rests our honor and our reputation; and let us keep ever before us the idea of proving to the public that the reflections that have been made upon our honesty and integrity in the past are, as far as all worthy members of our fraternity are concerned, nothing but a base slander and libel.

RURAL SANITATION

IF the trade wish to hold the building situation in hand when building operations open up there are only two ways to do it. First, more of those living and doing business in our cities and big towns should get out into the country and make room for those more heavily involved so that every other member of the craft will not be falling over each other, cutting the heart out of the profits and making business no more prosperous than if no business existed.

How many are there who can say that they have profited to the extent that they should have done in years gone by when the building boom was on? Very few, in fact the results were the very opposite.

Now the only way as we stated before is to spread out, get into the country, cater more to the rural resident, the farmer in particular.

These rural residents have the money. Rents in villages are not as high by 50 per cent. of the prices of a city home, and most of those people can grow all the vegetables, etc., for their own use. Further, the one big national problem in Canada to-day is keping the people on their farms. We firmly believe that there is not one rural district that has not suffered a decrease in the population, and most of this decrease is due to the fact that the average country home is not as comfortable or convenient as a city home.

We hear a great deal of the lure of city life, that country folk are flocking to our cities, and no doubt the city does appear to draw its young folk into the city, and then in turn the parents follow. But why? Could any sane person imagine the housewife of a farmer being lured to and enjoying city life if her home is fitted up with every city convenience?

The writer can prove different by practical experience and can show where scores of farm homes today have been fitted up to date with all and more than a city home can give, and the result has been that whole families have stayed at home, where previous to these improvements being made the young folks were discontented and seemed disposed to wander, once having been, say, to college in a city, and have felt more than all the loss of city home conveniences.

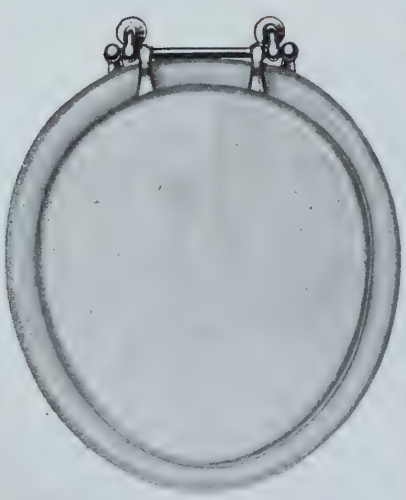
Sanitary and heating engineers can do more towards keeping the rural population intact than any other line of business men, and there is good money in their doing it. One thing to be careful of is that the farmer be not unduly exploited. Just because he is not possibly as conversant as to what he should instal as the average city man should be no reason why members of the trade should be lax in giving the advice that is essential. In fact, much greater care and good judgment should be exercised when catering to the requirements of the farmer.

The secret of a nation's success is happy, contented and prosperous farming communities, and the sooner Canadian citizens as a whole realize this, just so much sooner will the industrial life of every citizen in Canada or any other country become more prosperous.



B25—Blanco Close Ruff. S & C with concealed hinges

TRADE B.O.T. MARK



B202 —Blanco Rd. S & C with bar hinge

PATENTED AT OTTAWA FEB. 18 1918 PATENT NUMBER 181748

"BLANCO" SEATS ARE BUILT FOR SERVICE

A "Blanco" seat will not crack, craze, chip or discolor, and is perfectly white and smooth.

Can be procured in any style—post hinge with regular brass bar or concealed hinges in "Blanco."

Every "Blanco" seat bears our trade mark cut with a steam die. Look for it.

Every "Blanco" seat is built not only for beauty in design, but for lasting service.

Every B.O.T. closet combination can be equipped if desired with "Blanco" seat and fittings.

"Blanco" is protected by royal letters patent and is one of our many exclusive lines. Owned solely by us. Can be had through jobbers.

Side-step competition. Equip your show-room with a B4 all white outfit, including Vitreous china tank, B.O.T. patent bowl, B202½ "Blanco" seat. All brass parts "Blanco" coated.

Canadian Brass Company, Limited

GALT TORONTO

"CANADIAN"

COMPRESSION WORK
Has always been

sought by Plumbers who follow our motto

EFFICIENCY

AND

SERVICE

PROMPT SHIPMENT FROM STOCK

WE ARE THE CANADIAN PIONEERS IN HIGH GRADE GROUND KEY WORK

RED METAL EXTRA QUALITY

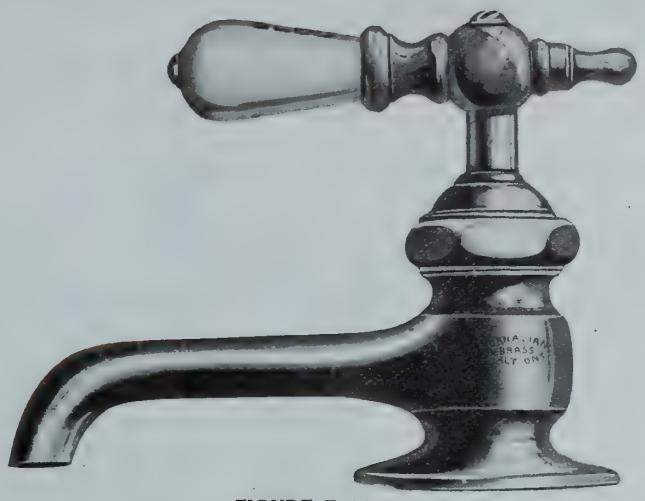


FIGURE E 1106



FIGURE E 1110

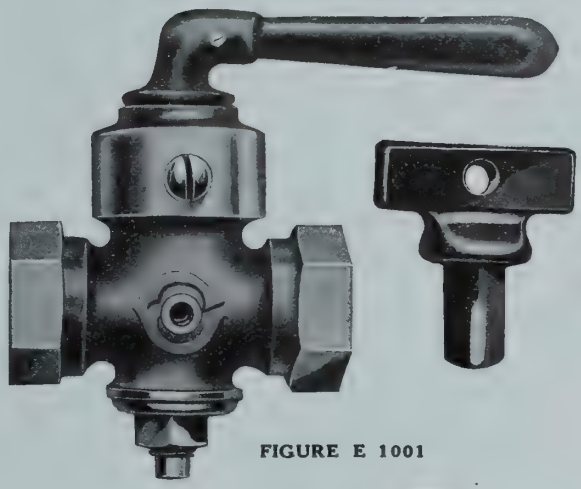


FIGURE E 1001



FIGURE E 1024

Canadian Brass Company, Limited

GALT TORONTO

Letters To The Editor

Being a Comment on an Editorial Which Appeared in the April 1st Issue of SANITARY ENGINEER entitled "Plundering Plumbers."

Editor of Sanitary Engineer,
Toronto:

Dear Sir,—I have read your editorial on "Plundering Plumbers," and I wish to congratulate you on the efficient manner in which you look after the interests of the trade in general. If the rank and file of the craft took half the interest that you display in their means of livelihood, the status of the sanitary engineer would be different to-day.

You certainly have put it up to sanitary engineers of Toronto when you make the assertion "If the Toronto plumbers are worth two cents they will demand a thorough investigation into the matters that appear to have raised the ire of that brainless member whose first lesson should be to think twice before he speaks once," and I might add especially when the subject is apparently one of which he knows little or nothing. However, as he could find nothing worth saying to gain publicity and free advertising he took to abusing the plumber to gain publicity in the daily press.

I am of the same opinion as yourself re investigation into the charge of plumbers having plundered the Board of Education, and think that it is the duty of the Ontario Society of Domestic Sanitary and Heating Engineers to see that an investigation is made into the charge, even at this late date. If certain members of the craft are guilty (?) of plundering the Board of Education, they should be singled out for the public censure they justly deserve as individuals, instead of casting a slur on the trade as a whole.

The time has arrived for the sanitary and heating engineer to stand on his dignity and demand a fair share of this world's goods for the invaluable services that he renders the public without having to submit to such slanderous statements as those made by such politicians of the small calibre of some of those serving the city, who make same as I have said before, merely to attract attention to themselves at the expense of the sanitary engineer (formerly plumber). I say formerly plumber with the thought in mind that the plumber years ago was merely a worker on lead but of his calling has grown the sanitary engineer, a man who has or should have the health and convenience of the general public at heart in his work. Would the large military camps of to-day be as healthy as they are had it not been for the mighty strides in sanitation? Statistics of old will answer that question when compared with to-day's.

I boldly assert that we have men in our calling to-day of greater mental ability than those who have been elected to represent us in the different bodies. We have at present only one sanitary engineer who has the distinction of being an M. P. in the present Union Government; it is a poor showing, but it is a start to greater things.

The recent attack by a member of the Board of Education goes to prove that until the sanitary engineer takes a greater interest in the government of our country we shall have to submit to such abuse as the present politicians see fit to deal out to us when it serves their purpose. If a few of our trade were to be found in the council of every city and town as well as lawyers and doctors, who seem to think that they hold a monopoly of the same, the craft would be looked up to instead of abused.

It is true that already we have secured a great deal of beneficial and protective legislation in Toronto and Ontario through the untiring efforts of one or two of the trade, who have spent a great deal of time and effort without remuneration that we all might be benefited This being so, how much more might we benefit if the ambitious, capable men of the craft were to offer themselves to the electors and the others assist in every possible way to secure their election. The "all for the other fellow and he for us spirit" would do a great deal to elevate our calling. The public will elect and have elected sanitary engineers, the following men, for instance: Mr. Mahoney as Mayor of Guelph, Alderman Ryding of Toronto, ex-Alderman Yeomens of Toronto, and Sheriff Bradley of the Buffalo Master Plumbers.

Another method of elevating the trade would be the use of the daily press with straightforward and honest advertising, if not individually because of the expense, then collectively as associations, in educating the public to the value of the service we render as conscientious public servants and the necessity of having their work done only by competent workmen supervised by employers whose sole aim is not the making of money only, but that of serving the public's best interests as well, and showing the distinction between the honest and dishonest trader. In these ways we could combat the work of the careless one and the jerry builder and prove that they are anything but the public benefactors they claim to be.

The above ideas may seem wise or otherwise, but I pass them on to you and to the trade in general for what they may be worth. Hoping to see other members of the craft give expression to their views on this subject through your valuable journal, knowing that the interests of all sanitary engineers are yours, and more power to you.

Yours respectfully,

ROY E. BELYEA.

WHAT IS "BLIGHTY?"

"Blighty," mysterious word that has come to us out of the east, has not come alone. The man who interlards his more intimate conversation with colloquial idiom possesses, perhaps unknowingly, a varied vocabulary of Hindustani. In other words, much of our middle class slang has an eastern origin, and has travelled westward with the troops.

Without question the British soldier has a positive genius for studding his conversation with gems from Oriental and other vernaculars, and as the great war has afforded to many more thousands of our citizen soldiers the opportunity of "slinging the bat" (as Kipling would say) in its proper environment, so we must anticipate for the future an even fuller eastern flavor and a brighter eastern color in our language. This, therefore, is by way of information and guidance to unfortunate munition workers and home-keeping specialists, that they may not be unjustly handicapped in their understanding and free employment of after-the-war popular idiom.

In Hindustani "Bilaiti" means the province of the Sahibs, i.e., Britain. Now the word has come to signify in the spoken speech of Britishers everywhere, "that glorious place of peace where the wounded go." A happy choice. When the thoughts of exiles in India go straying they will cry, "Oh, when we get back to 'Bilaiti!'" and when they long for their letters—sole link with home—they say, "Hasn't the Bilaiti day come yet?" So we find that, in the East as in Flanders, the word "Blighty" arouses all the tender sentiment that is associated with the sacred word "Home."—From the "Glasgow Herald."

THE VENTILATED EQUIPMENT OF A FIFTH AVENUE RESIDENCE

One of the well known landmarks of New York is a large brown-stone residence on the corner of 5th Avenue and 51st Street. This dwelling was built many years ago before modern conveniences were known, and though from time to time improvements have been added it has heretofore lacked a system of artificial ventilation. This defect has now been remedied, however, and a complete system has been put in.

In all three motor-driven ventilating fans have been installed, for the kitchen, ball room, and picture gallery, and the toilets respectively. These sets are installed in the upper floors in small rooms where they are out of sight but readily inspected when necessary. Quiet operation is essential for installations of this kind, and the equipment was selected with this feature in mind. All three fans are started and stopped by push buttons placed in or near the rooms served so that the ventilation can be readily controlled at the point where the air is needed. The speed of the motors is regulated by means of manually-operated field-and-armature control rheostats.

How to Secure the Public's Good Will

Investigation Proves Some Members of Craft Responsible for Bad Name Given to All—How to Remedy This—Good Will of Public Must be Secured—Advertising the Best Method.

Written for SANITARY ENGINEER by C. J. Morris.

"Ever had anything to do with plumbers?"
"Yes, the robbers!"

SUCH was the first reply to the above query which for the past few days I have been firing at all my friends and acquaintances. I was asked by SANITARY ENGINEER to give its readers my ideas as to the methods necessary for sanitary engineers to adopt in order to cultivate a friendly feeling on the part of the public and to overcome the undesirable reputation which plumbers seem to have acquired at the hands of the community generally, a reputation which has become almost proverbial. It therefore became necessary to find out first of all whether plumbers had really acquired the reputation referred to and if so to what causes such feelings on the part of the public were to be attributed. The best course to adopt to arrive at a satisfactory conclusion on these points seemed to be to ask the general public themselves. I therefore determined to try the first 30 or 40 men I met and see at what conclusions I could arrive after collating and classifying their replies.

Let me state that at the outset I was imbued with a preconceived idea favorable to the craft that investigation would show that the supposed sins and iniquities of plumbers were chiefly a myth, or the product of the over-lively imagination of the average newspaper man in need of a whetstone on which to sharpen his wit in much the same way as the proverbial mother-in-law, the lawyer and the young wife's cooking experiences have long been the butt of every would-be punster. I had had one or two experiences of my own which might have affected me adversely, but I had also in mind the remembrance of several cases in which work had been well done and at a reasonable charge and I therefore felt that the unsatisfactory incidents might well be regarded as exceptional cases which were liable to occur in any business.

Many Plumbers Unbusinesslike

After an impartial and patient investigation, however, I have been compelled to arrive at the conclusion that my preconceived ideas were not well founded and that the proportion of plumbers who (to put it mildly) do not conduct their business upon a business-like system is sufficiently large to afford justifiable ground for the unfavorable light in which the plumbing fraternity is commonly regarded and to render of the utmost interest to the craft any united action which may be taken with a view to eradicating any malpractices which may be found to be prevalent. Such at any rate I am convinced is true of the city of Toronto and it is no doubt more or less true of other cities.

There are, of course, many firms whose probity and honor are above suspicion, and these have to suffer from being regarded as in the same class with those who are less scrupulous in their dealings.

EDITOR'S NOTE.

SANITARY ENGINEER has felt so strongly the necessity of combating the antagonistic feeling which seems to be everywhere so prevalent as regards our craft that it decided to obtain an independent opinion as to the best means to eradicate this feeling and secure the good will of the public.

The writer of this article has, during the past few years, written many articles for SANITARY ENGINEER and our readers may rest assured that in saying what he does herein he is actuated solely by a feeling of good will for the craft whose interests he has at heart. The editor invites and requests comment and criticism on the ideas herein expressed.

One point worthy of note was that the older persons spoken to were by far the most vigorous in their denunciation of the craft and most instances quoted by them in support of their opinions were cases which occurred some time ago. Matters appear, however, to have improved somewhat of late years, and there is no doubt that present day plumbers are to some extent suffering for the sins of their forefathers.

Not every reply was as emphatic as that given at the beginning of this article, but practically every man to whom the question was put was able to mention one or more cases in which either he had been overcharged or the work had been badly done and had to be done over again.

Specific Reasons Given

With regard to the point as to whether the prices charged were justified I am not now concerned, but will deal with it later on. It is sufficient for my immediate purpose that all these men at any rate thought they had been overcharged which, for the purpose of considering their attitude of mind to the plumber, amounts to the same thing.

Now let us take one or two specific causes which have evidently been responsible for the antagonistic feeling evinced towards the craft. First and foremost we must place the complaint voiced by nearly all those questioned at the charges made for time before the work is commenced. It seems to be a general cause of complaint that the plumber always insists on walking to his job no matter what the distance and that he thus lengthens the time necessary to get there and that this time is charged for. This charging for time in getting to a job is further aggravated by the fact that a plumber never takes any tools with him on first going to inspect a job. It seems to be the general opinion that many a small job could be put right there and then if the plumber took one or two ordinary tools on his first visit, but it is charged that he deliberately refrains from taking tools with him in order that he may prolong the job and charge more for it.

The two practices above mentioned would, if rectified, probably eliminate at least 75 per cent. of the complaints made. I will deal later with the manner in which I consider they can be rectified; for the present I merely record them and will continue the enumeration of other sources of complaint.

Inefficiency Causes Complaints

Inefficient work is another prolific cause of complaint. Nearly every one at some time or other appears to have engaged a man quite incompetent to do the work. That this, however, only applies to a portion of the fraternity becomes evident from the fact that in each of the cases referred to another plumber was found who did the work satisfactorily. This suggests the thought that there must be a very large number of incompetent men registered as plumbers.

Unpunctuality and neglect are other plumber failings according to many. The writer himself has come across several cases of this nature. Word will be left at the plumber's that something requires attention at such and such an address, a promise is made that a man will call at a certain time and it appears to be quite a frequent occurrence that the plumber never comes near the place, or if anyone is sent it is frequently not till a day or two later. Of course no businesslike man or firm would treat customers in this way, but the enquiry shows beyond all doubt that this failing is not uncommon among plumbers generally.

Frequent complaints of pilfering and dishonesty are also laid at the door of men sent, even by respectable firms to do work. Let two instances from among many suffice as illustrations.

Instances of Dishonesty

Quite recently a pipe burst occurred on a pipe used for watering a lawn. Two men were sent by a plumbing firm to repair the trouble. Apparently they were short of an iron washer or some part required in fixing the tap. At any rate they coolly walked across the lawn to the next house, unscrewed the tap on the lawn there, took the washer they required and left the tap they had unscrewed

lying on the lawn. The victim of this outrage said he considered himself lucky they had not stolen the tap as well.

Another case. An old English family here have always made it a practice every year to have their Xmas pudding sent over from England. It was Xmas Eve and a fine specimen of this accompaniment of the festive season was in the pantry ready for the morrow's festivities, when something went wrong with the water and the plumbers had to be sent for. Xmas Day arrived and it was then found that the pudding was missing. The plumbers had eaten it all the day before, leaving only a few crumbs, and for the first time in their lives the family had to forego their Christmas treat.

Isolated instances of this kind do not, of course, prove that the plumbing fraternity are dishonest, but they do go to show that respectable firms (perhaps of necessity) employ men not of a very high moral standard, which is all to the detriment of the plumber's reputation.

Now at first sight it may appear an almost hopeless task to attempt to remedy the present state of affairs, but I am convinced that if resolutely undertaken by men honest and sincere in their desire to eradicate this hostile feeling which seems everywhere prevalent such a task may be entered upon with every prospect of success.

We now come to the question of what is the best course to pursue or the best methods to adopt.

Methods to Be Adopted

Three things have to be done. Firstly, it is necessary to convince the members of the craft themselves of the desirability and necessity, if they would see their chosen calling occupy an honored position among the arts and crafts of the present day, of earnestly endeavoring to gain the good will of the public. A campaign should be waged by circular letter and by personal talks to bring every sanitary engineer worthy of the name to this way of thinking. A series of strongly written and convincing circulars would go a long way toward achieving this end. The methods it is proposed to adopt should be outlined in these circulars and every member's written adherence to the plan should be asked for. In the small space allotted to this article there is not room to go into details of the various points which must be brought out and emphasized to convince every sanitary engineer of the urgent necessity of giving his hearty support to the scheme, suffice it to say that all worthy members of the craft must be made to feel that the good will of the public is not to be despised and is no unworthy object to endeavor to obtain. They must be shown that such good will is not to be obtained without some little trouble and perhaps sacrifice on their part, more especially having regard to the unfair reputation which has unjustly attached to all plumbers, good, bad and indifferent. Secondly, a campaign must be instituted having for its object the impressing upon all members of the craft the necessity for the adopting generally of more businesslike methods. With this we will deal further later on.

Persistent Advertising Necessary

Assuming then that a goodly proportion of the sanitary engineers of a city are in agreement among themselves as to the object in view, viz., securing the good will of the public, we now come to the third part of our campaign which is to convince the public of the earnest desire of the sanitary engineers to give them a square deal. Of the three this third task will in all probability prove less difficult than the first. The first will probably require no little personal work and persuasive talk on the part of those in charge of the campaign.



The Sanitary Engineer must himself be earnest in his desire to secure the good will of the public

The third will resolve itself more into a matter of expense and this will test the sincerity of the sanitary engineers themselves. Methodical and persistent advertising is the only means by which the public can be made to realize the sincerity of the craft and its desire to see that every person coming to them is fairly treated, and advertising costs money. Having regard, however, to the benefits which would undoubtedly accrue to those joining in the movement no one should grudge his share in this outlay which when spread among many would not be felt burdensome.

A list should be compiled of all sanitary engineers interested, and every man whose name appeared on such list should signify his willingness if called upon to have any charge made by him submitted to a committee chosen from among these sanitary engineers by themselves. The public should be invited to apply for these lists of names and should be informed that in any case in which any man whose name appeared on that list was employed the committee would investigate any supposed cause of complaint and would see that the complainant was fairly treated.

It would not be long before any sanitary engineer on the list would find it to his advantage to let the public know by notice on his shingle that his name was on the list referred to, and the public would soon begin to associate all names on such a list with the idea of a square deal in plumbing. The success of the scheme would depend on two factors; firstly, upon a sufficiently persistent course of advertising, and secondly, upon the earnest desire and intention of the sanitary engineers themselves to faithfully carry out the promises made to the public.

The above is only a rough outline of the scheme proposed. It can be elaborated and no doubt improved upon in detail, but it suggests a definite method whereby the stigma that has for so long been attached to the plumber may be once and for all removed.

Comment Invited

It was the writer's intention to deal further, as mentioned above, with one or two minor matters such as the question of the best methods to be adopted to satisfy the public as to complaints of overcharging and also the question of charging for time occupied in going to and from work. Space, however, will not permit, and these points will be treated in a separate article later on. Meantime what has been written is subject to comment from any member of the craft who has the matter at heart and whose criticism and assistance in further developing the scheme suggested will be heartily welcomed.

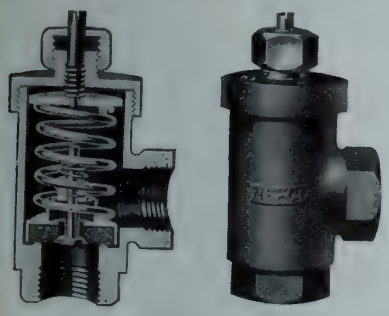
New Sanitary and Heating Goods

A NEW BOILER PRESERVATIVE

A new boiler preservative named "Metlskin," for treating boilers so as to clear same of scale, etc., is being put on the market by the Canadian Fairbanks-Morse Co., Montreal. The manufacturers claim that it contains no ingredients that will injure the boiler or any part of the system of piping to which it is connected.

NEW HEAT GENERATOR

A new heat generator is being placed on the market by the Canadian Fairbanks-Morse Co., Ltd., Montreal, and some very novel claims are made for same. It is known as the Nefco heat generator. It can be placed anywhere on the line to expansion tank that is most convenient—either in a vertical or horizontal position, and will confine the water in the system until a pressure is



Nefco Heat Generator

created by the expansion of the water sufficient to overcome the tension of the spring.

This confinement of the water in the system means a more vigorous and rapid circulation, and that the water may be heated to a much higher temperature before passing to the expansion tank, thereby causing a substantial saving of coal.

When the pressure of the water in the system due to expansion reaches that point to overcome the pressure of the generator against it, the valve opens and the water passes to the expansion tank. When the water cools and contracts it returns to system through check valve in generator.

The Nefco Heat Generator is made of high-grade brass. The springs are phosphor-bronze, the valves are provided with Jenkins Bros.' discs. It is absolutely noiseless, requiring no air chamber or rubber bumpers.

NEW CATALOGUE

The D. C. Manufacturing Co., Canton, Ohio, are distributing literature describing some very novel lines of brass goods, viz.: Patented bath waste and overflow, which operates in combination with the hot and cold water supply. A line of patented compression stop and waste cocks and boiler cocks, the latter open against the pressure. A post card to above address will bring this literature to you.

NEW CATALOGUES

The Cleveland Flush Meter Co., Noble Court and West 2nd St., Cleveland, are distributing some very interesting literature describing their line of flush valves. Any readers desiring to be furnished with this literature should write to above address.

NEW CATALOGUE AND FOLDER

The Vaile-Kimes Co., of Dayton, Ohio, are distributing a splendid loose leaf bulletin folder containing five bulletins, more of which may be added as published. These bulletins are specially prepared with some very useful information to the trade regarding their full line of pneumatic water systems.

A post card to above address will procure the above literature.

VENTILATION UNNECESSARY

(Continued from page 29.)

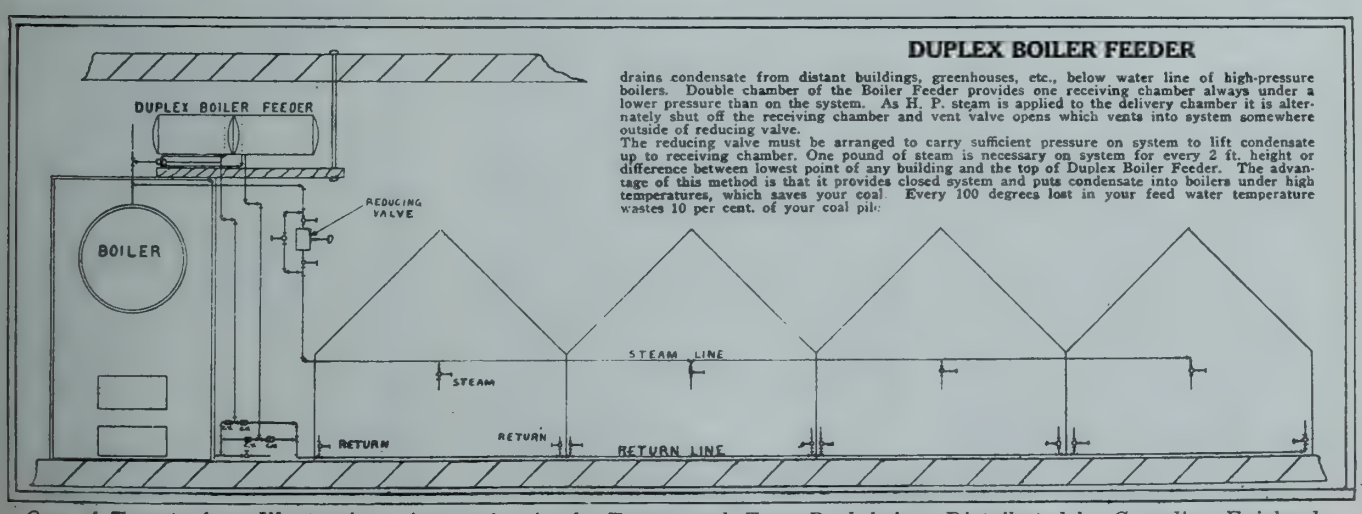
made by an English scientist, giving amazing results, entirely upsetting the theories of the ventilating fiends. Subjects were placed in air tight compartments and it was only when the air rose above a certain temperature that they became at all distressed. Upon the air being agitated or cooled they were instantly relieved. Vitiation of the air by being breathed over and over again was found to be practically negligible and harmless.

Similar and even more extensive experiments have just been concluded by the New York State Commission on ventilation, giving equally convincing results, proving, as Benny Potts would say, that doctors and sanitary experts do not know it all. Specially prepared rooms and more than a hundred persons were used in the experiments. The temperature and not the freshness of the room was found to be the important thing. Subjects were kept for six successive days in an entirely unventilated chamber, breathing the confined and much used air, and did just as good work, both mentally and physically, and felt just as well and happy as when in thoroughly ventilated rooms with the air constantly changing. Moreover, their heart action, circulation and general physical condition were found to be not in the slightest impaired.

It strikes me that the health bulletin of the future will be quite a different document from that now being handed out by the wise guardians of our health. H. C. Munro, February 11, 1918.

COMMENCING BUSINESS

Oshawa, Ont.—F. D. Garrard is commencing a plumbing and hot water heating business at 150 Division Street.



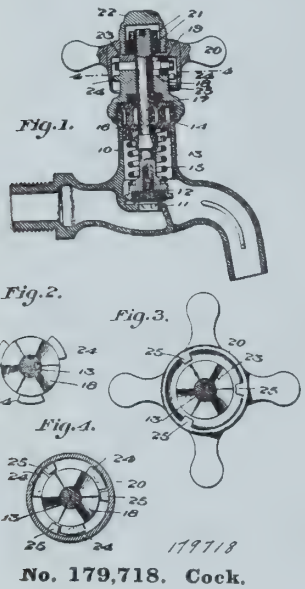
One of Twenty-four Illustrations Appearing in the Farnsworth Trap Book being Distributed by Canadian Fairbanks-Morse Co., Montreal

New Canadian Patents

No. 179,718.

Philip Mueller and Anton C. Schuermann, co-inventors, both of Decatur, Illinois, U.S.A., 16th October, 1917; 6 years. Filed 13th August, 1917. Receipt No. 283,196.

Claim.—1. In a self-closing valve, the combination of a body portion having a valve seat, a valve having a stem, means tending to close said valve, an operating handle on said stem, means between said handle and body portion to lift said valve and stem when said handle is rotated, stop means on said body portion, and stop means on said handle, said stop means being angularly and vertically movable relative to each other, so as to bring their upper and lower surfaces into frictional contact when said handle is rotated to



No. 179,718. Cock.

limit the rotation of said handle and lift of said valve.

2. In a self-closing valve, the combination of a body portion having a valve seat, a valve having a stem, means tending to close said valve, an operating handle on said stem having a depending skirt to house the upper part of the valve body and the operating parts between said handle and body portion to lift said valve and stem when said handle is rotated, stop means on said body portion, and stop means on the skirt of said handle, said stop means being angularly and vertically movable relative to each other so as to bring their opposed upper and lower surfaces into frictional contact when said handle is rotated to limit the rotation of said handle and lift of said valve.

3. In a self-closing valve, the combination of a body portion having a valve seat, a valve having a stem, means tending to close said valve, an operating handle on said stem having a depending skirt to house the upper part of the valve body and the operating parts between said handle and body portion, means between said handle and body portion to lift said valve and stem when said handle is rotated, radially projecting stop means on the exterior of said body portion and radially projecting stop means on the interior of the skirt of said handle, said stop means being angularly and vertically movable relative to each other so as to bring their opposed upper and lower surfaces into frictional contact when said handle is rotated to limit the rotation of said handle and lift of said valve.

4. In a self-closing valve, the combination of a body portion having a valve seat, a valve having a stem, means tending to close said valve, an operating handle on said stem, means between said handle and body portion to lift said valve and stem when said handle is rotated, stops on said body portion, and stops on said handle, one of said sets of stops having an extended area and being offset from the other set of stops, so that upon relative angular and vertical movement of said stops their opposed upper and lower surfaces are brought into frictional contact to limit the rotation of said handle and lift of said valve.

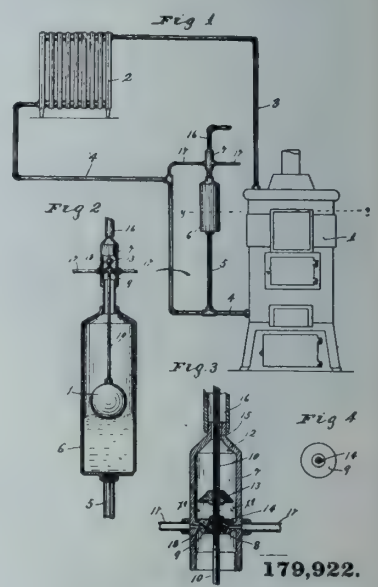
5. In a valve, the combination of a body portion having a valve seat, a valve having a stem, an operating handle on said stem, a stop on said body portion, a stop on said handle, one of said stops having an extended area, said stops being angularly and vertically movable relative to each other, so as to bring their opposed upper and lower surfaces into frictional contact when said handle is rotated to limit the rotation of said handle and lift of said valve.

No. 179,922.

Richard Martin, Minneapolis, Minnesota, U.S.A., 23rd October, 1917; 6 years. Filed 28th June, 1917. Receipt No. 281,509.

Claim.—1. In a heating system, the combination with a boiler, a radiator, a feed pipe between said boiler and radiator, and a return pipe between said radiator and boiler, of an air venting conduit tapping said return pipe at a point above the water level of said boiler and leading to the atmosphere, a float chamber, partly above and partly below the water level of said boiler and connected to said boiler at a point below the water level thereof, a float in said chamber, a valve actuated by said float and operating by a partial vacuum in the system, to close said air venting conduit, and an air conduit leading from said float chamber and arranged to be opened when the first noted air vent is closed by low altitude of water in said float chamber.

2. In a heating system, the combination with a boiler, a radiator, a feed pipe between said boiler and radiator and a return pipe between said radiator and boiler, a float chamber partly above and partly below the water level of said boiler and connected to said boiler at a point below the water level thereof, a valve casing having upper and lower valve seats, the latter being connected to said float chamber, an atmospheric air vent leading from the upper valve seat, a float in said float chamber having a projecting stem, two valves on said stem, one for engagement with said lower seat, and the other for engagement with said upper valve seat, an air venting conduit leading from said lower valve seat and tapping said return pipe at a



Vapour Heating System.

point above the water level of the boiler, and a small air passage constantly connecting the upper portion of said valve casing to the upper portion of said float chamber.

3. In a heating system, the combination with a boiler, a radiator, a feed pipe between said boiler and radiator, and a return pipe between said radiator and boiler, a float chamber partly above and partly below the water level of said boiler and connected to said boiler at a point below the water level thereof, a valve casing having upper and lower valve seats, the latter being connected to said float chamber, an atmospheric air vent leading from the upper valve seat, a float in said float chamber having a projecting stem, two valves on said stem, one for engagement with said lower valve seat, and the other for engagement with said upper valve seat, an air venting conduit leading from said lower valve seat and tapping said re-

turn pipe at a point above the water level of the boiler, a small air passage constantly connecting the upper portion of said valve casing to the upper portion of said float chamber, the said two valves being independently adjustable, one with respect to the other.

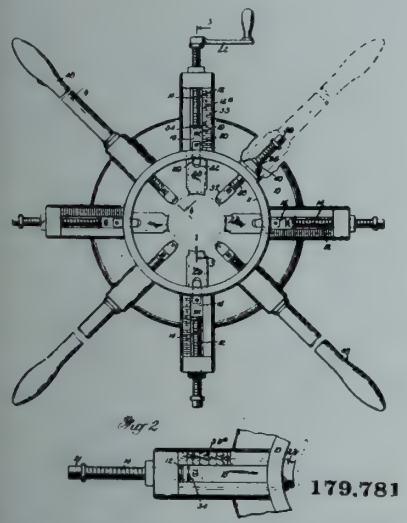
4. In a heating system, the combination with a boiler, a radiator, a feed pipe between said boiler and radiator, and a return pipe between said radiator and boiler, of a float chamber partly above and partly below the water level of said boiler and connected to said boiler below its water level, a valve casing having interior valve seats at its upper and lower extremities, the said upper valve seat leading to the atmosphere and the said lower valve seat being connected to said float chamber and to said return pipe at a point above the water level of the boiler, a float in said float chamber provided with a projecting stem, and two valves on said stem, one engageable with the said upper valve seat under upward movement of the float and the other engageable with said lower valve seat under downward movement of said float.

No. 179,781.

Francis Augustus Lovegrove, Halifax, Nova Scotia, Canada, 16th October, 1917; 6 years. Filed 14he. May, 1917. Receipt No. 279,689.

Claim.—1. In a pipe threading and cutting machine, a frame having a central opening, add a radial guideway extending therefrom, there being a threaded orifice in the frame at the outer end of the guideway, a block having a cutter for moving in the guideway, and a screw articulated to the block and meshing in the threaded orifice.

2. In a pipe threading and cutting machine, a frame having a central opening and a radial guideway extending therefrom, there being a threaded orifice in the frame at the outer end of the guideway, a block having a cutter for moving in the guideway, and a screw articulated to the block and meshing in the threaded orifice, there being a mark on the block and a scale on the frame at the guideway, for the purpose specified.



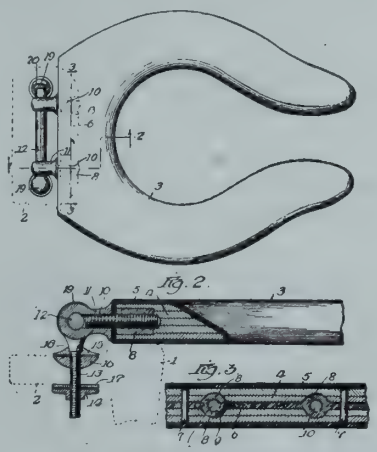
Pipe Threading and Cutting Machine.

3. In a pipe threading and cutting machine, a frame having a central opening and a radial guideway extending therefrom, guides at the sides of the guideway, there being a threaded orifice in the frame at the outer end of the guideway, a block having a cutter for moving in the guideway and provided with recesses in which the guides are disposed, and a screw articulated to the block and meshing in the threaded orifice.

No. 180,112.

The Brunswick-Balke-Collender Company, assignee of Earldley C. B. Judd, both of Chicago, Illinois, U.S.A., 30th October, 1917; 6 years. Filed 20th August, 1917. Receipt No. 283,459.

Claim.—1. The combination of a water closet seat and a hinge therefor, said seat comprising a core of laminated wood and a veneer of hard vulcanized rubber thereon, and a metal plate embedded in the core and spaced from the inner surfaces of the top and bottom layers of said veneer, said plate having threaded openings to receive hinge members.



No. 180,112. Hinge.

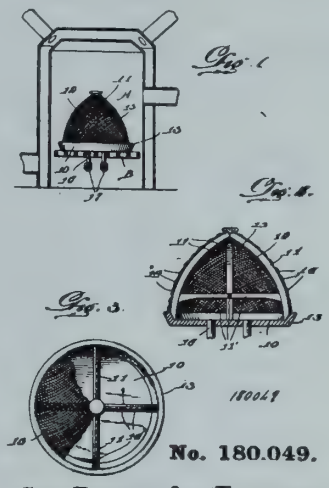
2. The combination of a water closet seat and a hinge therefore, said seat comprising a core and a veneer of hard vulcanized rubber thereon, and a plate embedded in the core and spaced from the inner surface of the top and bottom layers of said veneer and having spoced integral enlarged portions provided with threaded openings, and hinge members engaging said openings.

3. The combination of a water closet seat and a hinge therefor, said seat comprising a core of laminated wood and a veneer of hard vulcanized rubber thereon, a metal plate embedded within the core and spaced from the inner surface of the top and bottom layers of said veneer, said plate having spaced integral semi-cylindrical enlarged portions extending therefrom on the top and bottom thereof and provided with threaded openings, and hinge members engaging said openings.

No. 180,049.

John Hicks, Calgary, Alberta, Canada, 30th October, 1917; 6 years. Filed 28th June, 1917. Receipt No. 281,513.

Claim.—1. A combustion chamber embodying a domeshaped skeleton frame composed of diametrically disposed arch-shaped ribs, a gas mantle adapted to cover said ribs, and means adapted to contact with said gas mantle.



Gas Burner for Furnaces.

2. A combustion chamber embodying a dome-shaped skeleton frame composed of diametrically disposed arch-shaped ribs, a gas mantle adapted to cover said ribs and projections carried by said ribs for engagement with the gas mantle.

3. A combination chamber embodying a dome-shaped skeleton frame composed of diametrically disposed ribs, a gas mantle adapted to cover said ribs, and projections carried by the said ribs for engagement with the gas mantle.

4. A combustion chamber embodying a base, a dome-shaped skeleton frame composed of diametrically disposed arch-shaped ribs, a gas mantle adapted to cover said ribs, and means carried by said ribs for contact with the gas mantle.

5. The combination with a furnace, of an auxiliary combustion chamber adapted to be supported upon the grate thereof, said chamber embodying a dome-shaped skeleton frome composed of diametrically disposed arch-shaped ribs, a gas mantle adapted to cover said ribs, and means carried by said ribs for engagement with the mantle.

"TURNING WASTE INTO PROFIT"

This is the title of a 28-page booklet, size 8½ x 10¾ inches, recently issued by the Prest-O-Lite Co., Inc., Toronto, dealing with the importance of conservation of steel and iron through oxy-acetylene welding and cutting. This booklet is profusely illustrated with half-tone engravings showing many examples of Prest-O-Lite welding repairs, which have saved money for manufacturers, railroads, mines, machine shops, engineering and industrial plants in almost every line. We have been advised by the Prest-O-Lite Company that a copy of this booklet will be mailed free of charge to anyone interested.

Market Conditions and Tendencies

Statements Regarding the Prices and Trend of Supplies.

THE MARKETS AT A GLANCE

THE continued strength of the tin market has been responsible for an advance in the price of solder in some quarters. Tin is becoming increasingly scarce and the future of the many manufactured lines into which it enters is one of great uncertainty. There are a few odd licenses for shipments to Canada being granted but as the shortage in Great Britain becomes more pronounced it is not hard to determine how all exports from that country will be curtailed. Spelter has declined ½c per pound and lead and antimony are both in easier tone.

Shipments of 10 and 12 gauge black sheets and plates have reached the local market and declines in price have been registered. Stocks in some quarters are now in very good shape and demands are being taken care of promptly.

The difficulty in securing supplies of raw materials is resulting in restricted production of wrought iron pipe and manufacturers indicate they are experiencing considerable difficulty in getting orders away as quickly as they would like. Stocks are by no means heavy and a very good demand is apparent. No change in the situation in boiler tubes is expected prior to the coming month. At the present time stocks are very limited and further supplies are not expected before May at which time some revision in price may be necessary. Business in some lines is reported good while in others no improvement is yet apparent.

TORONTO, April 12.—Little change has been made in market prices during the past couple of weeks. Advances in the price on wiping waste and valves are expected to develop shortly. A heavy demand has been apparent in waste and new stocks, it is thought, will reach higher levels. The continued strength of the brass market and increased manufacturing costs are given as reasons which may influence to higher levels. In some quarters a readjustment of prices on solder has been made, the scarcity of tin and increasing high prices being factors. Business in many lines is showing marked improvement, but others show little change.

Conditions Unchanged In Range Boilers

RANGE BOILERS.—No change of any nature marks the situation during the past couple of weeks. Prices are held at firm levels and no change is expected to develop for some time. Little if any improvement in the amount of business transacted has been made.

	Standard	Extra Heavy
30-gallon range boilers....	$14.00	$17.00
35-gallon	17.00	20.50
40-gallon	20.50	24.00
52-gallon	28.00	32.00
66-gallon	37.00	42.00
82-gallon	45.00	50.00
100-gallon	62.00	70.00

Enamelware Firm And Unchanged

ENAMELWARE.— Rumors of a change in the price of enamelware have been current in the trade, but enamelware manufacturers see no reason to believe any change will be made. Increasing costs of materials and production would justify an advance, but fairly heavy stocks are available and prices are likely to be uniformly held. Business shows no improvement as yet and prices are steady as follows:

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Sinks, roll rim, 18 x 30 in., staple.....	16 80
Closets, oak tank and seat	22 00
Do., enamel iron or white vitro tank...	23 75

Little Change In Soil Pipe Situation

SOIL PIPE, FITTINGS.—There is little new to report in respect to soil pipe and fittings. Business continues along quiet lines and shows practically no improvement since last issue. Cast iron and malleable pipe fittings are enjoying a somewhat better sale and prices have been firmly maintained. Discounts are quoted as follows:

SOIL PIPE FITTINGS.

Medium and extra heavy soil pipe, 6-inch and under	35%	2½%
8-inch soil pipe	....	30%
Medium and extra heavy fittings, and under	40%	2½%

C. I. PIPE FITTINGS.

Cast iron fittings	....	15%
Cast elbows, tees, etc.	....	15%
Plugs	25%	
Bushings	30%	33%
Flange unions, standard	....	20%
Dart unions, ¼-inch to 2-inch.....	20%	25%
Do., 4½ in. and larger	....	15%
Nipples, up to 4-inch	....	45%
Do., 4½-inch and larger	....	40%
Do., running thread 4-in. and under	....	25%
Couplings, 4-in. and under	....	35%
Do., 4½ in. and larger	....	15%

MALLEABLE FITTINGS.

	Black	Galv.
Malleable Fittings, Class A, lb.....	0 50	0 63
Do., Class B, lb. net.....	0 22	0 33
Do., Class C, lb. net.....	0 15	0 22

Waste May Advance; Oakum Unchanged

WASTE, OAKUM.—Indications point to an advance in all lines of wiping waste in the near future. The demand has been exceedingly brisk of late and new stocks which will be available for the local market are likely to be sold at higher levels. Prices range from 16 to 21c per pound for white. Nothing of interest has developed in respect to oakum. Supplies are limited and not being renewed in sufficient quantities to provide for a surplus. Prices on both waste and oakum as shown in current market quotations reveal no change during the week.

		Per 100 lbs.
Best American	....	$21.50
U.S. Navy unspun	....	20.75
Plumbers' spun	$8.50	10.00

Valves In Very Firm Tone, May Advance

VALVES.—The position of valves is one of strength and indications are that revised prices at higher levels may be made necessary. Business shows good volume and quotations shown below are unchanged.

	Discount off list
Ground work	50
Compression work, standard	52
High grade	45
Cushion work	46
Fuller work, standard	50
High grade	43
Basin cocks, No. 0 standard	46
Nos. 1 and 2	46
Bath cocks	53
Flatway stop and waste cocks, standard.	53
High grade	50
Roundway stop and waste cocks, standard	53
High grade	50
Brass steam cocks, standard.....	Net
Globe, angle and check valves, standard.	10
Do., removable seat	7½
Radiator valves, standard	15
Do., removable seat	10
Patent quick opening valves	35
Basin Cocks—	
No. 0 and 1, Fuller pattern	50
No. 0 and 1, compression	46
Midget	50
Globe, angle and check valves, medium pressure	30
Radiator valves, standard	30
Radiator valves, Jenkins disc	30
Radiator valves, quick opening	40

Wrot. Iron Pipe Firm; Supplies Hard To Get

WROUGHT IRON PIPE.—The present market is firmly held, but great difficulty is being experienced by manufacturers in getting through a sufficient quantity of raw materials to keep up production to a point to take care of the demand. Stocks are only fair and the demand has been very good. Prices re-

main unchanged during the week on the following basis:

Boiler Tubes Scarce; Further Supplies Coming

BOILER TUBES.—Boiler tubes are scarce and until new supplies are available little change in the present quiet conditions is expected. Further stocks are due to arrive early next month and at that time there may be some slight revision in prices necessary. The present basis remains as follows:

Toronto—	Per 100 feet Cold drawn	Lapweld
1 inch	$36 00	$ ....
1¼ inch	40 00	....
1½ inch	43 00	36 00
1¾ inch	43 00	36 00
2 inch	50 00	36 00
2¼ inch	53 00	38 50
2½ inch	55 00	42 00
3 inch	64 00	50 00
3¼ inch	....	58 00
3½ inch	77 00	60 00
4 inch	90 00	75 00

Plates Decline $1.00; Black Sheets Arriving

SHEETS, PLATES.— Receipts of plates and heavier gauges of black sheets are reported during the week and prices are down over $1.00 per 100 pounds in plates. A decided reduction in 10 and 12-gauge sheets has also been reported. Stocks now in will relieve the shortage existing in some quarters materially Galvanized sheets which had been arriving in very good volume are again being held back, but stocks locally are in very fair shape. Inquiries for sheets display considerable interest in this product and a fair volume of business is being transacted. Quotations available on black and galvanized sheets are shown below.

BLACK SHEETS—	Per 100 lbs.
10 gauge	$9 50
12 gauge	9 60
14 gauge	8 40
16 gauge	8 50
18-20 gauge	8 05
22-24 gauge	8 10
26 gauge	8 15
28 gauge	8 25
3-16-inch plate	9 10
¼-inch boiler plate	9 00

GALVANIZED SHEETS—			
10¾ oz.	$ 9 00	$9 25	$10 50
U.S. 28	8 90	8 95	10 20
U.S. 26	8 40	8 65	9 90
22 and 24	8 25	8 50	9 75
18 and 20	8 10	8 35	9 60
16	7 95	8 20	9 45
14	7 85	8 10	9 35

Revision In Solder; Future Uncertain

LEAD AND ZINC PRODUCTS.—Revised prices on solder have been made in some quarters, the tendency being toward higher prices. The scarcity of tin is acute and the future on solder and other items containing tin contains an element of uncertainty. Prices established during the week in some cases widen and others narrow the range as shown below. Quotations issued are for guaranteed, 51c to 53c; strictly, 48c to 52c; commercial, 42c to 46c; wiping, 41c to 43c; wire, 50½c per pound. Manufactured lead products remain unchanged though in some quarters it has been intimated that an advance might be made. The demand is limited.

Lead pipe, lb.	$ 0 14	$ ....
Lead waste pipe, lb.	0 15	....
Lead traps and bends	Net list	

WROUGHT IRON PIPE

Effective Feb. 26, 1918

Standard Buttweld—	Per 100 feet Black	Galvanized
⅛ in.	$ 6 00	$ 8 00
¼ in.	5 16	7 29
⅜ in.	5 16	7 29
½ in.	6 55	8 12
¾ in.	8 28	10 41
1 in.	12 24	15 39
1¼ in.	16 56	20 82
1½ in.	19 80	24 89
2 in.	26 64	33 49
2½ in.	42 71	53 53
3 in.	55 85	70 00
3½ in.	70 84	87 76
4 in.	83 93	104 10
Standard Lapweld—		
2 in.	29 60	36 08
2½ in.	44 46	54 70
3 in.	58 14	71 53
3½ in.	72 68	90 62
4 in.	86 11	107 37
4½ in.	97 79	122 56
5 in.	114 00	142 82
6 in.	147 80	185 28
7 in.	192 80	241 57
8 L in.	202 50	253 75
8 in.	233 30	292 32
9 in.	279 50	350 18
10 L in.	259 20	324 80
10 in.	333 70	418 18

Terms 2% 30 days, approved credit.
Prices—Ontario, Quebec and Maritime Provinces.

Lead wool, lb.	0 16	
Lead sheets, 3 to 3½ lbs. sq. ft., lb.	0 13¼	
Lead sheets, 4 to 8 lbs. sq. ft.	0 12½	

Cut sheets, ¾c lb. extra, and cut sheets to size, 1c lb. extra.

Solder, guaranteed, lb.	0 51	0 55
Solder, strictly, lb.	0 46¾	0 52
Solder, commercial, lb.	0 42	0 50
Solder, wiping, lb.	0 41	0 45¼
Solder, wire, lb.	0 50½	....
Zinc sheets, per lb.	0 26	....

Old Materials Working Under Gov't. Restrictions

OLD MATERIALS.—Business remains within the smaller scope brought about by reason of the embargo remaining in force. Dealers see no chance of a change in the situation. It may be that the American situation is being reflected in the Canadian trade. In United States centres the complaint is that users of scrap are buying too close. They are using only what they have to and buying accordingly. The dealers, with their customers in this frame of mind, find it a hard matter to properly interpret the future possibilities of the market. The trade generally is laboring under Governmental restrictions. Prices remain unchanged and the volume of business transacted is light.

Tea lead	$ 0 04½	....
Heavy lead pipe	0 07	0 07½
Yellow brass	0 12	0 13
Red brass	....	0 21
Light brass	....	0 09½
Heavy zinc	0 05½	0 06
Heavy copper	0 21½	0 22
Stove plate, per ton	17 00	18 00
Old cast iron, per ton	25 00	26 00

Spelter Declines ½c; Lead And Antimony Easier

INGOT METALS.—Spelter has declined ½c per pound during the week and lead and antimony are also slightly easier. The relation of spelter and lead, the former usually a fairly high priced metal and the latter the reverse, is interesting in that prices are virtually the same. Spelter is now low and lead high. Tin is practically unobtainable, and though prices are named it is safe to say that were stocks offering considerably higher prices could be secured. No great hope for the future is held out in the matter of supplies.

COPPER.—Nothing of interest is shown in the situation during the week. Reports from the United States indicate that production is being maintained at a sufficiently high rate to take care of Government requirements and provide a surplus. Prices locally at 30c to 32c per pound show no change.

TIN.—It would appear that there is a world-wide scarcity of this metal but that Canada is being discriminated against in the matter of supplies from Great Britain is not even hinted at. The future holds out little promise of sufficiently large receipts to take care of all demands. Whereas local prices are named as 95c to $1.00 per pound, there would be little difficulty in those having any to offer securing higher figures. However, the market here is bare of stocks and manufacturing will soon deplete these to the point of exhaustion.

SPELTER.—A decline of ½c per pound to make prices locally 9¼ to 9½c per pound featured an otherwise dull market. The lower prices do not seem to have stimulated interest to any appreciable extent and buying is light.

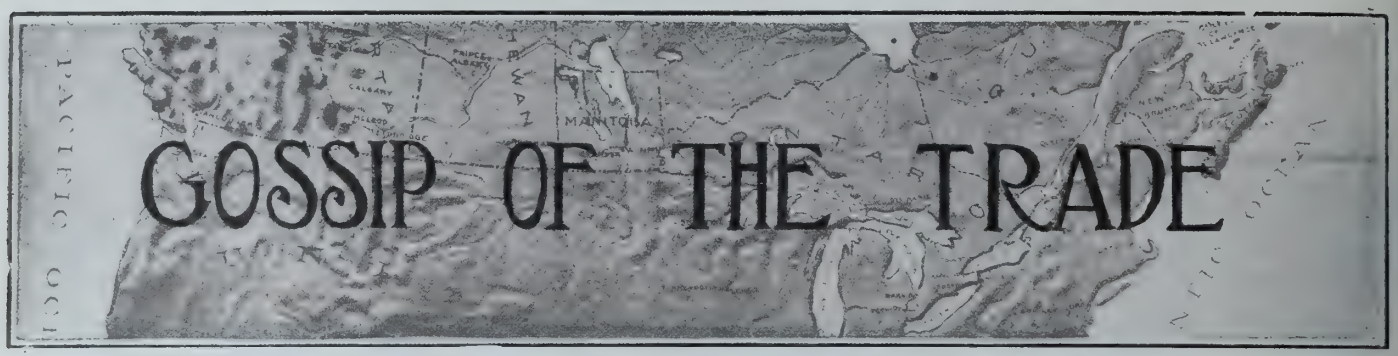
LEAD.—The market remains in a very easy position and there is nothing of moment to report. Prices range from 9c to 9½c per pound.

ANTIMONY.—A low price has been made on this metal of 16c which widens the range slightly, quotations being as high as 18c per pound. Limited trading is in evidence.

ALUMINUM.—No developments of an interesting character mark the situation this week though in some quarters a price as low as 50c per pound is asked. The range on this basis would be from 50c to 60c per pound.

PIG IRON.—Reports from the United States are encouraging in relation to pig iron production. Increased receipts of coke are reported and a general increase in ovens operating is shown. Similarly improved conditions are being reflected in Canada, and April output is expected to be encouraging. Foundry iron at $49.50 per ton is unchanged.

IN North-Eastern Oklahoma and South-Eastern Kansas, according to a bulletin of the Oklahoma Geological Survey, there are several thin beds of coal covering large areas. Until recently these coals have not received very favorable notice. The deposits consist of almost continuous beds and are from 1 ft. 6 in. to 2 ft. in thickness. The coal is of extra good quality for shallow coal. The beds are covered with an overburden of shale and clay from less than 10 ft. to 30 ft. in thickness. Some of the deposits, as well as narrower strips along the outcrop of the principal beds in the main part of the field, have been worked in the Oklahoma field, one near Lehigh and the other at Henryetta.



TRADE NOTES

Medicine Hat, Alta.—Wade & Perkins, sanitary engineers, have dissolved partnership, Perkins continuing.

INCORPORATIONS

Toronto.—John Price, Ltd., has been incorporated with a capital of $200,000 to manufacture and sell brick, terra cotta, tiles, drain and sewer pipes. George P. Price and Chas. H. Price are provisional directors of the company.

A CORRECTION

In an advertisement of the West Toronto Foundry Co., which appeared in SANITARY ENGINEER some time ago, the statement was made that the Mac Syphon discharged 90 gallons per nour. This was not correct, and was an error on the part of the publisher.

It should have read 90 gallons per minute, or 5,400 gallons per hour.

ESTABLISHING NEW FACTORY

In order to obtain more factory space for their increasing activities, the Mason Regulator and Engineering Co. of Montreal are vacating their present factory for more commodious quarters at 135-153 Dagenais street. The head office of the company will still be maintained at 380 St. James street.

ECONOMIZE IN HEATING

Alterations in the present heating system at the Stratford Collegiate Institute, whereby in milder weather the entire school could be heated from one boiler instead of requiring two, have been decided on by the collegiate board. At present each boiler only heats part of the school, and it is now planned to make the radiation a single unit. It is estimated that from 25 to 50 tons of coal will be saved this year by it. F. L. Duggan has the contract for $447.

CHANGE OF ADDRESS

Dr. Wm. Paul Gerhard, C.E., of New York, informs us that he has moved from his old address and can now be found at 17 West 42nd St., New York.

Dr. Gerhard has contributed quite a number of very interesting articles to SANITARY ENGINEER and is also one of our foremost authors in sanitary engineering, having written quite a number of splendid books, one of his latest short works being that of a booklet recently published entitled the "A. B. C. of Sanitary Drainage."

TEST CHATHAM WATER

Experiments in the purification of Chatham City water by ultra violet rays will be carried out by Hydro authorities of the city. Equipment has been ordered with a capacity of purifying 120 gallons an hour. The purified water will be supplied to hospitals and schools. If the experiment proves successful, waterworks officials may consider treating city water in this way.

A NEW AND INTERESTING BOOKLET

A very interesting booklet is being distributed by the Canada Metal Co., Toronto, entitled, "Soldering Hints." It contains 12 pages, is illustrated, and contains some valuable information on the subject of solder and soldering. It can be procured by dropping a post card to the above concern.

CONTRACTS AWARDED

Halifax, N.S.—Longards, Ltd., 215 Hollis Street, has plumbing and heating contracts for repairs to home for the trustees of Old Ladies' Home.

Montreal West, Que.—A. F. Byers, Ltd., 340 University Avenue, has general contract, and will let plumbing and heating contracts for the erection of a high school for the Board of Education.

Montreal, Que.—J. A. Gordon, 301 St. Antoine Street, has plumbing and heating contract for alterations costing $7,000 to office building for the Somner Building.

Moncton, N.B.—Sumner Company, 635 Main Street, has plumbing contract for repairs, costing $13,000, to creamery for the Farmers' Co-operative Creamery, Ltd.

Moncton, N.B.—Thos. Johnston & Co., Ltd., 736 Main Street, have plumbing, and Sumner Company has heating contract for $25,000 business block for L. H. Higgins.

WATERWORKS, SEWAGE

Ford City, Ont.—Public Works Department of the City Council are preparing plans for the laying of 7,000 feet of sanitary sewer, costing $30,000.

Halifax, N.S.—Plans have been prepared for the construction of sewers and water mains for the Canadian Government Railways, Ottawa.

Hanover, Ont.—Town Council contemplates new waterworks system.

Walkerton, Ont.—Town Council contemplate the construction of a sewer on McGiveron Street.

Weston, Ont.—Plans are in progress for a $20,000 filter house and filter for the Town Council.

Dereham and North Dorchester Townships, Ont.—Township Councils will call tenders for drainage works, costing $3,500.

Sydney, N.S.—Board of Works will extend a sewer service along Cottage Road and is contemplating the extension of the water service in the same district and a sewer extension along Richmond Street and Victoria Road.

Province of British Columbia.—A bill to amend the Water Act provides for a special fund of $500,000 for government work for maintenance and extension of irrigation systems in the province.

CONSTRUCTION

London, Ont.—Erection of a $30,000 addition to bank for the Bank of British North America is planned.

Montreal.—F. W. Woolworth Co., Ltd., 180 Yonge Street, Toronto, contemplate the erection of two stores in this city.

Leamington, Ont.—Tobacco factory for the Rock City Tobacco Co., 224 Dorchester Street, Quebec, will be erected at a cost of $35,000.

New Richmond, Que.—Tenders will be called by the architect, P. Levesque, 115 St. John Street, Quebec, for the erection of a $10,000 presbytery for Rev. Chas. Michaud.

Windsor, Ont.—The Universal Button Company, Walker Road, Walkerville, contemplate the erection of a $15,000 factory.

St. Hyacinthe, Que.—Louis Caron, St. Jean Baptiste, Nicolet, is preparing plans for "Hotel Dieu" Hospital, to cost $600.000, for the Grey Nuns.

Montreal, Que.—Bigoness & Bigoness, 60 Notre Dame Street E., Montreal, are preparing plans for the erection of a church for the Notre Dame Du Bon Pasteur.

Toronto.—The Imperial Order of the Daughters of the Empire Preventorium, 2653 Yonge Street, are raising funds for the erection of a $60,000 preventorium and infants' home.

Montreal.—Hutchison, Wood & Miller, 2 Place D'Armes, are preparing plans for the erection of a Sunday school building for the Stanley Presbyterian Church, Stanley Street.

Winnipeg.—Carter-Halls-Aldinger Co., Union Bank, have the general contract for rebuilding theatre, at a cost of $75,000, for N. J. Williamson, 103 Breadalbane Apartments.

Winnipeg.—Plans calling for the erection of new buildings involving an expenditure of $1,000,000 for the Tuxedo Military Hospial and the Soldiers' Home have been announced.

London, Ont.—Tenders are being called for the erection of a $15,000 factory extension for the Peerless Hosiery Co., Ltd., Adelaide Street.

Lauzon, Que.—The parish of St. Joseph de Levis contemplate the erection of a $100,000 church or large extensions to present building.

Leamington, Ont.—The Imperial Tobacco Co. intend to erect a warehouse and curing building to cost $50,000.

Elora, Ont.—The Board of Trustees want estimates at once on new system of heating and ventilating for the High School.

Hamilton.—F. W. Warren, architect, Bank of Hamilton Bldg., has been instructed by the Board of Control to draw plans for the new market building on York Street.

Edmonton.—The councils of the City of Edmonton and five neighboring rural municipalities contemplate the erection of a large addition to the Edmonton Hospital.

Hamilton.—The Frid Construction Co., Bank of Hamilton Building, have the general contract for $15,000 one-storey brick addition to factory for J. R. Moodie & Sons, Ltd., King Street and Sanford Avenue. The general contractors will let other trades.

Humboldt, Sask.—A. E. Pike, Park Street, has the general contract for $20,000 departmental store for C. Bruser, Franklin Street.

ANSWERED HIS COUNTRY'S CALL

The Dominion Radiator Co. has at least had for the present to relieve one of their representatives in the person of Geo. A. MacNicol, who for many years called upon the trade in the West, central and eastern Ontario. George volunteered some time ago and has joined the Canadian Engineers and is, we believe, by now on his way overseas. He has heard his country's call, and we know he will uphold the dignity of his country as well as of his family.

The name MacNichol has long been associated with the Dominion Radiator Co., and the members of the trade will, we are sure, wish George a heartfelt godspeed and safe return. His brother, Lieutenant Jas. A. MacNicol, has been in France for over a year with the Imperial Forces; he was a Queen's man and an expert railroad engineer.

Another brother, J. R. MacNicol, is at present the sales manager of the above named company. So that the trade without doubt will feel no small amount of interest in knowing that the family of "MacNicols" are doing their bit. J. R. is not only an efficient sales manager, but he takes a live interest in civic affairs, and in all is doing his part, like his brothers, to make this good old world a little better place to live in because the family of MacNicols live in it.

If we could only imbue that spirit into every man, woman and child, that it is one's duty to see to it that this world shall be better because he or she lived in it, what a difference there would be. What an improvement would be found in every corner of the earth.

SANITARY ENGINEER wishes to join the friends of the MacNichol boys in its sincere hope that ere long we will have the pleasure of reporting their safe return.

IN SYMPATHY

One of the largest Vancouver firms has the following notice hung up in the office, which we feel sure will bring a sympathetic tear to the eye of many of our readers:

"We have been in this business since 1892. We have been pleasing and displeasing the people ever since.

"We have been cussed and discussed, boycotted, talked about, lied about, lied to, hung up and rubbed down.

"The only reason we are staying in business now is to see what the hell is going to happen next."

NEED OF BETTER URBAN AND RURAL DEVELOPMENT

The importance of promoting more scientific methods of rural as well as of urban development is engaging the attention of prominent groups of citizens in all belligerent countries. It is generally agreed that recovery after the war in each nation will be the more rapid in proportion as more efficient methods are applied to secure the increase of production. Canada has never failed to apply the doctrine of Adam Smith to incite the natural efforts of the producers by means of promoting a condition of freedom amongst its citizens and encouraging the settlement of land by the real users of the land. Unfortunately, however, land speculation has been so little controlled and the planning and laying out the land for economic use has been so much neglected, that production has been hampered and bad social conditions have grown up. Incitement to natural effort by means of mere ownership of the land has proved inadequate because of these deficiencies—and the quality of the natural effort has been impaired as a result of overcrowding and bad sanitation in the cities and isolation and poverty in the country.—T.A.

THE WAY TO SUCCESS

Power is the goal of every worthy ambition and only weakness comes from imitation or dependence on others, says a writer in "Success." Power is self-developed, self-generated. We cannot increase the strength of our muscles by sitting in a gymnasium and letting another exercise for us.

Nothing else so destroys the power to stand alone as the habit of leaning upon others. If you lean you never will be strong or original. Stand alone or bury your ambition to be somebody in the world.

The man who tries to give his children a start in the world so that they will not have so hard a time as he had is unknowingly bringing disaster upon them. What he calls giving them a start probably will give them a setback in the world. Young people need all the motive power they can get. They are naturally leaners, imitators, copiers, and it is easy for them to develop into echoes or imitations. They will not walk alone while you furnish crutches; they will lean upon you just as long as you will let them.

One of the greatest delusions that a human being could ever have is that he is permanently benefited by continued assistance from others.

THE TRADE PAPER

THE trade paper is limited to certain conditions and features sometimes not considered by the average reader. The daily newspaper has new material in the way of politics, legitimate news matter, and when interesting news matter fails there is a demand for other kind of news, or at least the newspapers think so, because they publish it.

It must be remembered that trade progress is slow and the trade paper cannot invent news in the way of trade progressiveness; it must rely upon facts.

The trade paper differs radically from the newspaper, whether it be daily or weekly, and the so-called popular magazines, fiction, short stories, are entirely out of place, or at least they have never found favor with the editors and readers of trade papers. Its field is educational. It must keep the reader informed of what is going on in his trade, and all the time stay close to the facts. Probably there is no other class of publications that does less theorizing and stays in the well-beaten paths of facts as do the trade papers. For these reasons the trade press is looked upon as accurate and dependable in its statements.

Every trade paper is worth the price of its subscription rate in a single issue, and if it is not read carefully the subscriber is the loser.

Read your trade paper; don't merely subscribe for it. The meat of a whole article, the very feature that fits your case, may be found in a single sentence. The idea may be germinated in your mind that might be worked into one of the most profitable features of your business.—*Sheet Metal Journal.*

THE necessity for sound and rapid judgment in aerial combat will be realized when it is stated that if two opposing machines were circling round a fixed mark at the rate of 100 miles per hour and 1,000 feet apart, a bullet fired directly from one machine to the other would miss its mark by 120 feet.

The Importance of Expansion Tanks

Not Sufficient Thought Given to the Expansion Tank in a Hot Water Heating System—Many Heating Engineers Simply Install Them Because Their Father Before Them Did So—Too Often It Is Hidden Away Out of Sight.

IN this article are shown two more methods of connecting up the expansion tank to a hot water heating system. Fig. 3 is an improvement on Figs. 1 and 2 which are shown in April 1st issue. Fig 3 shows the expansion pipe connected to the flow pipe of the system. In this pipe, or on the line to which this pipe is connected, the water in the system first expands and when such a type of connection is made, the pipe returning to the boiler should be smaller than the one that is connected to the radiator.

In some cases it has been found that the radiator has been short circuited, because of the fact that the water could more easily rise in the pipe to the expansion tank than through the piping and radiator, especially when there happens to be a large number of fittings placed in between the riser from a lower floor and the radiator than there was necessary to connect up to the expansion tank.

But when ordinary precautions are taken this method will work all right, though it is not by any means ideal. Such a method however will tend to prevent the water in the expansion tank from freezing, and as this is one of the main things we are considering for the present, we will not take up too much of our readers' time finding fault with the layout shown in Fig. 3.

One thing it may not be out of place to mention and that is that providing the expansion tank is 6 or 8 feet above the top of the highest radiator there is scant likelihood of the radiator being "by-passed" or short-circuited because of the increased static head.

Fig. 4 shows how every expansion tank should be fitted up, where conditions arise which prevent the installing of the tank in any place which is protected from frost.

For example, it may be that the expansion tank must be placed in between the ceiling and the rafters, so as not to spoil the appearance of a room. Then a copper coil should be placed in the inside of the tank and connected up in such a way as to be a separate heating unit.

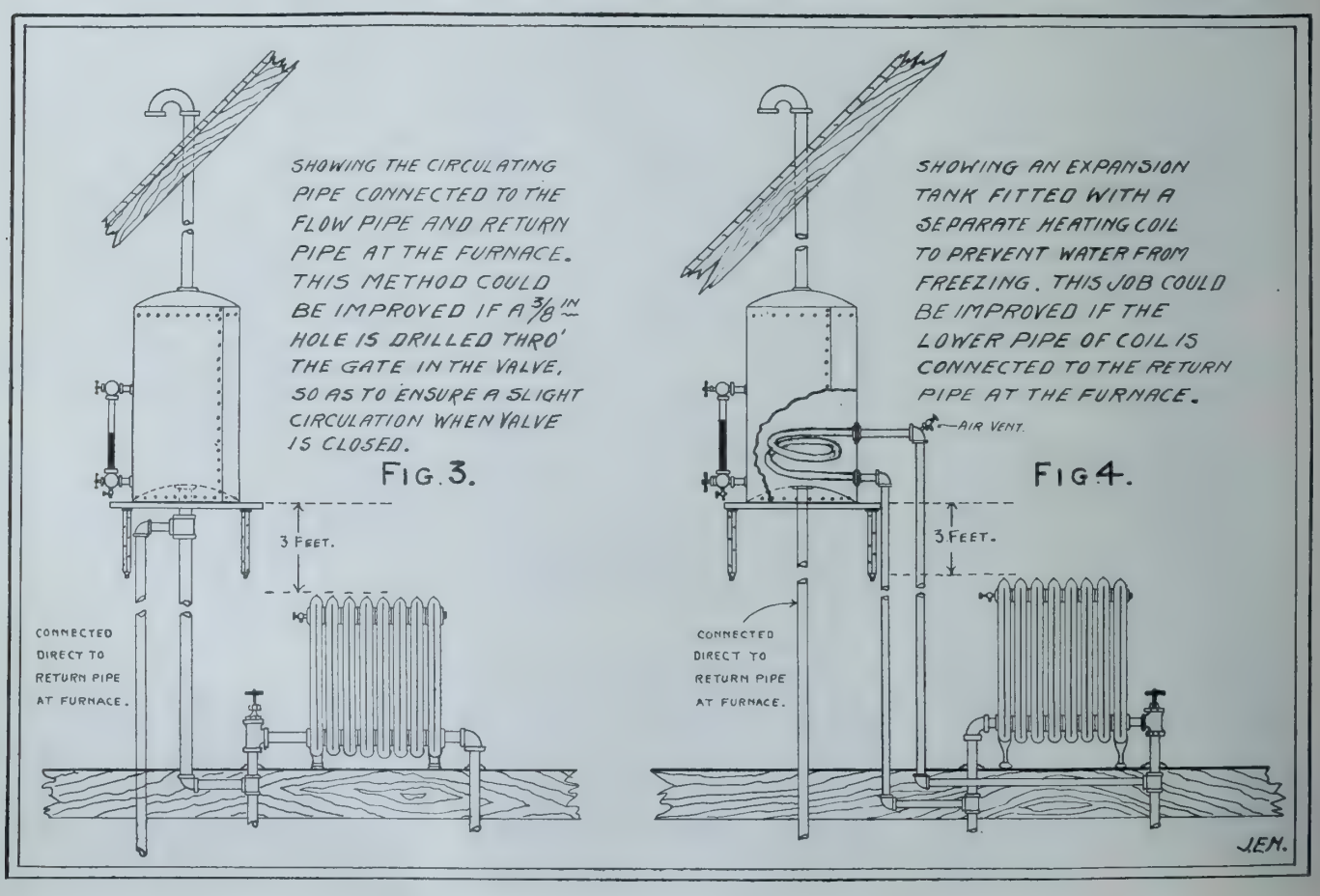
It will be seen that the coil is connected with the system just as if it were a separate radiator. The coil has no connection with expansion pipe in the regular way. By connecting the lower pipe of the coil direct with the return pipe close to the furnace, or at one end of the return header, an improvement to the installation can be made.

Some heating engineers may not agree with the connecting of the expansion tank to the return heater of the furnace, but it can be proved by actual experience that by so doing heating systems can be made very much more efficient than by adopting the practice shown in Fig. I and II. The following explanation will also prove this.

We will ask our readers to turn to the last issue, and note Fig. I. Here the open end, or pipe to which the expansion tank is connected is simply connected to the return pipe on the highest radiator. When the water expands, it is relieved at the expansion tank, and there the matter ends. There is simply the common expansion of the water taking place through the whole system, larger piping etc. But when the tank is connected with say a one inch pipe, with all the friction that is ordinarily set up through the fittings that are generally needed, there is a greater restriction to flow which creates a little resistance than is the case when the expansion tank is connected as shown in Fig. I.

In a later issue we will show how the expansion tank in the attic may be dispensed with altogether, and thus obviate the necessity for all these precautions in connection with the elevated expansion tank.

(Continued in next issue)





Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

DO DOMESTIC COILS IN FURNACES SAVE COAL

Editor Sanitary Engineer,—I have begun to try and sell gas water heaters and one of my best customers is overhauling his heating system, which is hot water.

Several members of the trade are figuring on the job, and I have advised that he take the coil out of the furnace, which, by the way, is leaking, and in its place have a copper coil gas water heater installed. This will cost him more money, but it is up to me to prove that I am right.

Further, I might add that it took the furnace all its time to heat the house last winter. It is a No. 4 —— and there is slightly over 600 square feet of radiation on it now. The range boiler is 40 gallons capacity.

My only hope of getting this job and at the same time holding my customer is to get some independent authority who can tell me just how much heat loss there is in a furnace when a coil is inserted in the fire box. Hoping you can write me by return mail, as I want to put this job over before one of the other fellows gets in too strong and takes the job.

S. E. R., Manitoba.

We replied to our correspondent's enquiry by return mail as follows:

"Regarding the heat loss in a hot water furnace, when a coil is inserted in the fire pot, we can emphatically state that there is a considerable loss. The best authorities show us that for every gallon of water stored in a hot water storage tank, which in this case would be the range boiler, there is a heat loss equal to three feet of hot water radiation.

For example, our correspondent informs us that the range boiler is 40 gallons capacity, which, according to our calculations, would prove that the 40-gallon boiler is equal to a heat loss to the furnace of 120 square feet of radiation. This being the case, by installing a gas water heater the furnace will be assisted to the extent of increasing its heating power 120 square feet.

It will be seen that a No. 4 furnace of the type given is 667 square feet inclusive of mains, and that there already are over 600 square feet of radiation on it, as well as the domestic coil equal to another 120 square feet. This speaks very well for the furnace, but it is too much altogether to expect a furnace that size to do the work it has been apparently doing under forced firing. We would be inclined to strongly advise that the gas water heater be installed permanently and take out the coil, even then the furnace is pretty near to being overloaded, but, as our correspondent says, it worked fairly well during last winter, at a pinch. No doubt taking the coil out and overhauling the furnace will be sure to improve matters considerably and will give the furnace a better chance to do the work it is expected to do.—Editor.

CONVEYING SEWAGE DOWN HILLSIDE

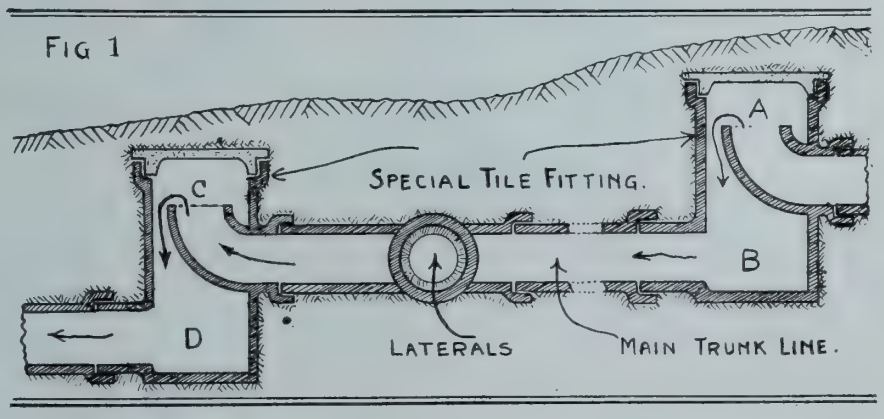
Editor Sanitary Engineer,—I am a new subscriber to your journal and would like to ask you to help me solve a problem in connection with a sewage disposal job that was installed by a farmer in our locality, and which is not working satisfactorily.

The pipes underground are laid about 18 inches below the surface, but the ground is sloped.

At first when the job was put in, it appeared to work all right, but this spring the odor from moisture at the foot of the sloped ground which is about 250 feet away from the septic tank is simply unbearable. My contentions are that the ground has become waterlogged at the lower end, as the sewage simply flows down the main pipe to the lowest level of pipes, and so on.

Is there any way of fixing this job so as to prevent the discharge going to the lower end first? I know the pipes are just laid with one main 6-inch tile drain, and branches taken off at right angles by using junctions 6 inches by 4 inches. COUNTRY PLUMBER.

FIG 1



With the meagre information given we can not do justice to this inquiry but assuming that the laterals are not too close together, and that they are laid fairly level, we would suggest that our inquirer write to some of the clay tile pipe manufacturers and get them to make him up as many special tile fittings as there are lateral lines of field tile pipe.

Sketch of fitting is shown in Fig. 1. Then they can be simply inserted into the main line of 6-inch drain pipe, taking care not to have the point of overflow as shown at A and C more than two feet from the laterals.

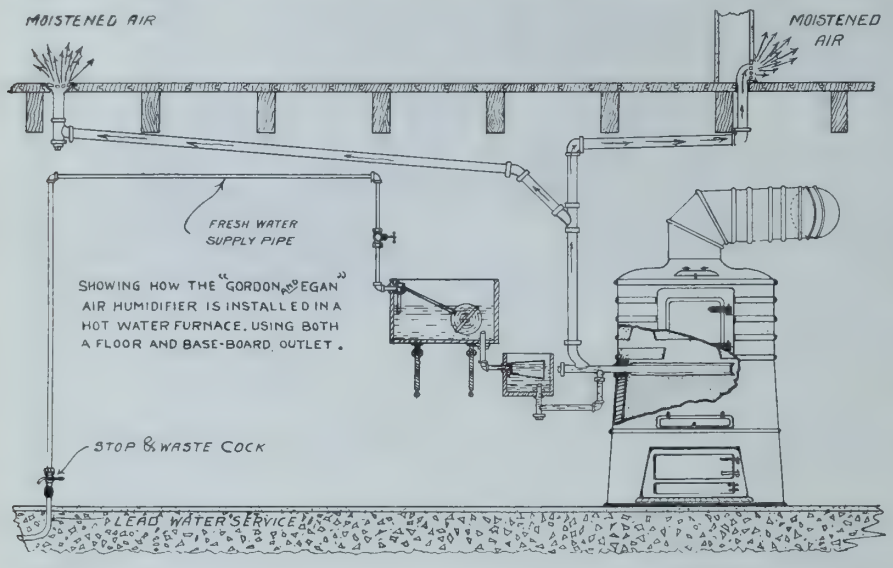
It will be seen that the sewage will then discharge over A and fill the first laterals, then overflow into the lower line B and again flow over C to lower level D and so on, filling the laterals at the higher levels first.

We do not know that these fittings can be procured from stock, but we are informed that any clay tile pipe manufacturer can easily make them and that when installed they will overcome "Country Plumber's" trouble.—Editor.

HOW TO INSTAL A HUMIDIFIER

Editor Sanitary Engineer,—Some time ago you published a number of articles on humidity. You referred to one called the Gordon & Egan Humidifier, and I could not see how it would be possible to get the air moistened in the rooms all over the house when the pipe which appears to convey the moisture is placed a little above the top of the furnace. That would mean that all the moistened air would be in the cellar. How could it get up into the rooms above?

Quoting from your article you say: "To secure best results have the vapor opening 5 near the foot of the main stairs about 15 inches from the wall. Put is directly under the well opening, thus allowing the moist air to rise to the upper flats more easily."—Interested One.



Replying to the above, we might state that the opening 5 shown in the article referred to on page 20 of the January 15 issue, should have been described as being inserted either in the floor or the baseboard of the main floor, situated not too far from the furnace.

We have pleasure, however, in showing a more accurate layout of this system. If the furnace is situated in a central part of the basement, and the moist air can be distributed to two portions of the house, the job will, we think, give better satisfaction.—Editor.

FAULTY PNEUMATIC WATER SYSTEM INSTALLATION

Editor Sanitary Engineer:

I am enclosing herewith a rough drawing of a pneumatic water system which has been installed about 3 years. It has never been satisfactory, and I would be very pleased if you could explain in the question box of the SANITARY ENGINEER what the real trouble is.

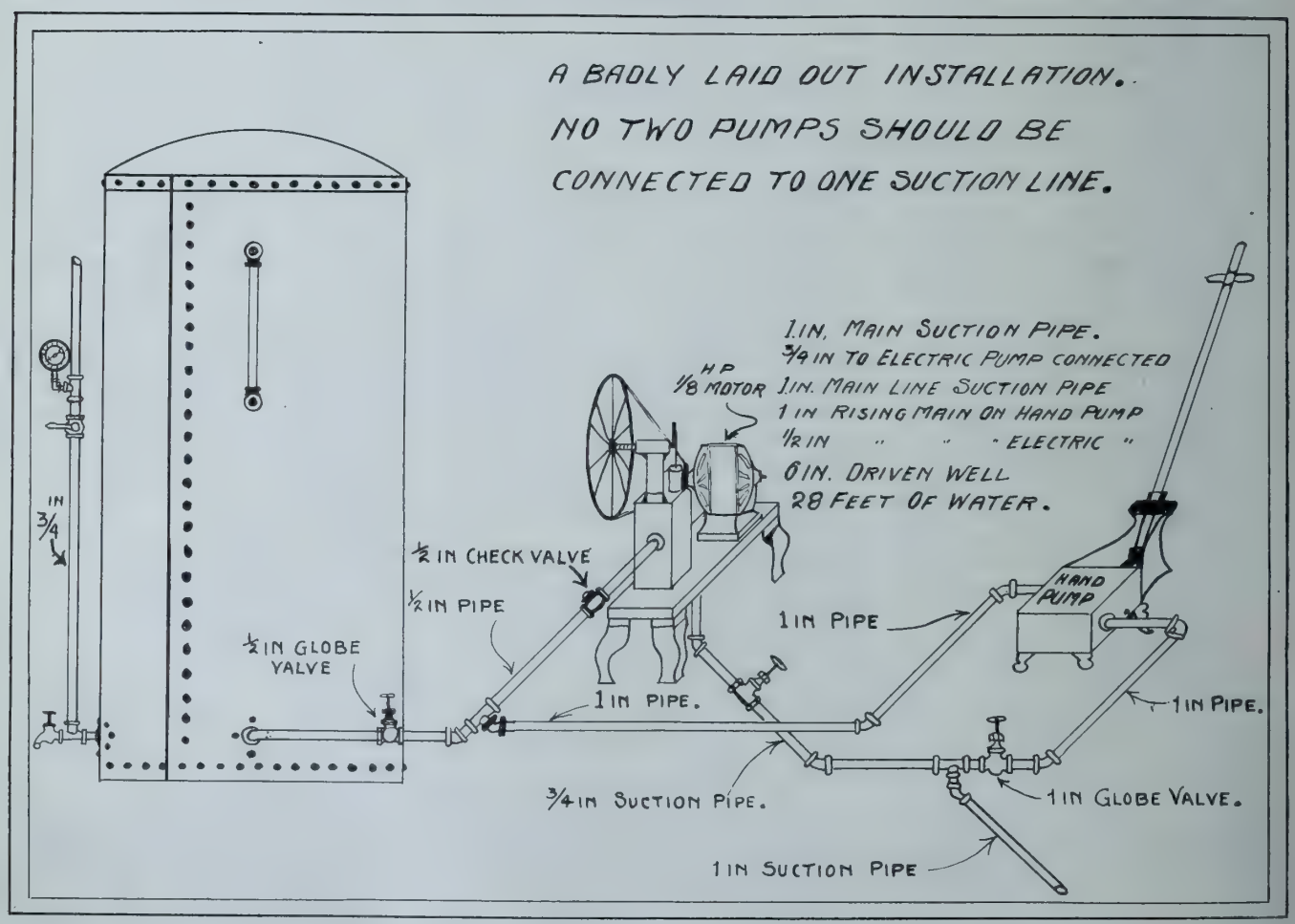
The whole outfit is a very popular make, and I have installed quite a number of the same make and never had any trouble with them.

I was called in to see this outfit. nearly two years ago and advised separating the suction line and running a separate ¾ in. line to the electric pump, but on account of the pipe having to run under the cellar floor, the owner does not want to do this.

They have managed very well with the hand pump up to date, and at different times I have got the electric pump to work splendidly for a short time, but it has failed just as often.

I have carefully examined the valves and packing and have found everything in first class order. I omitted to say that

(Continued on page 48)





MUELLER

Rapidac Basin Cocks

Rapid Acting

HERE is another distinct MUELLER triumph—a Rapid-Acting Compression Basin Cock; a basin cock with a grace of line and beauty of design coupled with unusual strength and wear-resisting power. The handle is held to the stem by means of the MUELLER patented corrugations. These corrugations mesh perfectly and no amount of use will cause the handle to become loose or wobbly. A malleable iron washer on the shank locks the cock immovably to the lavatory in any position desired.

The MUELLER lines of rich, red brass goods are the means by which you can guarantee your customer maximum service minus the expense of repairs.

We have always realized that our first duty was to our Government. The war must be won. We have been working incessantly since 1914 in manufacturing munitions. Our output along these lines, totals over 55,000,000 brass forgings, but by expanding our capacity and equipment we have been able to take care of our regular line of business so that it has not suffered appreciably and at the same time we have been able to more than fulfill the demands of our munitions contracts. Mueller means service both to you and to your customer.

H. Mueller Mfg. Co., Limited

Sarnia **Canada**

MUELLER

FAULTY PNEUMATIC WATER SYSTEM

(Continued from page 46.)

I did not instal this particular job in the first place and I always feel safer in taking no chances by hitching two pumps to one suction pipe. What is your opinion? Any information on this matter will be appreciated for more reasons than one. First that I want to feel sure that I am right in the stand I take and the other is that I want some other outside evidence to protect the good name of the outfit and also convince my customer as to the remedy.—R. B. B.

The accompanying illustration shows the installation referred to by R. B. B. There is very little to say about it except that no two pumps should be placed on one suction line, because of the fact that the very slightest leak at either pump is bound to interfere with the suction of the pump in operation.

In this particular job, however, there are two courses to follow. One would be to disconnect the hand system altogether and make sure that the pipe ends going to and from the hand pump be made perfectly air tight.

Then there would be no reason whatever why the electric system should not work, except that to expect any pump to lift water a vertical distance of 28 feet is almost expecting too much. But if all valves are tight as well as the plunger packing kept in good order, the outfit may do very well.

Then there is the other way to overcome the trouble, that of installing another suction line.—Editor.

CAN CRACKED RADIATORS BE REPAIRED AND HOW?

W. R. W. also wishes to know if there are any acids, fluxes or other compounds that can be used to solder cast iron radiators that have cracked with frost, or is there any way to repair same.

As far as can be learned, there is no way to solder cast iron radiators in the ordinary sense as defined by the term soldering.

There are appliances, however, known as oxy-acetylene welding outfits, that can be used to weld cast iron radiators, cracked furnace sections or cracked jacket heaters. These appliances are not very expensive if much welding can be gotten.

All manner of welding can be done by sanitary engineers with such an outfit, also pipe can be cut very easily, wrought iron or cast iron.—Editor.

CONDENSATION IN SMOKE PIPES

Editor Sanitary Engineer:

Can you suggest a remedy for chimney troubles as follows? Some chimney pipes leak condensation through the joints. What is the reason, and a remedy? Also what is the cause of a back-draft, even when chimneys are several feet higher than any surrounding building?—W. R. W.

The reason why condensation flows from a chimney or smoke pipe is because it is located in a cold place and the moisture in the smoke, which is generally from a wood fire comes in contact with the cold pipe and of course it condenses. The only way to prevent this is to cover the pipes with air celled asbestos covering.

Next, in case any condensation does occur, the pipes should be so fitted together that the moisture will flow over the joint, see accompanying sketch.

The apparent "back draft" is not so easily explained, because conditions may differ in so many ways which could explain the reason.

But there is one reason and that is that the air in the room does not vary to a sufficiently great extent to overbalance the air pressure outside. A cold chimney will also assist setting up a "back-draft."—Editor.

SANITATION OF FACTORIES

(Continued from page 27.)

for a higher standard of health, cleanliness or morality among the people is to be commended, and should be encouraged. If we are to retain our sturdy and courageous manhood, then we must see that the conditions under which men labor shall not make them unfit to meet an emergency.

The great orator, Macaulay, speaking in the British House of Commons in 1846, on the subject of factory employees, said: "Where health is concerned, and where morality is considered, the state is justified in interfering with the contracts of individuals." And he further stated: "Never will I believe that what makes a population stronger, and healthier, and wiser, and better, can ultimately make it poorer. If ever we are forced to yield the foremost place among nations, we shall yield it to some people pre-eminently vigorous in body and mind."

Cost of Water Wastage in Montreal

Sanitary Engineer Takes More Than an Ordinary Interest in This Question—Better Plumbing and Heating in Our Homes—Less Cheap Junk W.C.'s and Water Taps Eliminate Waste

IN a report which he has completed recently, City Engineer Mercier, of Montreal, shows in a striking and emphatic manner how costly are the unnecessary water-tap leaks. Universal metering of the service would tend to remedy all such leaks, as it would then prove more costly to the householders to neglect them than to repair them.

"A tap from which water is leaking drop by drop," says Mr. Mercier in his timely report, "loses 12 gallons of water in a day, which amounts to 84 gallons in a week and 4,368 gallons in a year. It costs 29 cents to pump the yearly wastage on one tap. For 1,000 taps so leaking, eleven tons of coal would be required and $290 in salaries.

"But the loss assumes graver proportions when the tap is one-thirty-second open. It spills 211 gallons a day, 1,178 a week, 76,876 a year. A thousand such taps require in a year 177 tons of coal to pump the water and $5,380 in salaries. Putting this loss in concrete terms, it may be thus estimated:

"Five cars of coal; or the salary of five constables; or the salary of five firemen; or the cost of paving 2,000 square yards of street, which represents the piece of St. James Street between St. Lawrence Boulevard and Place d'Armes. Further, it represents the cost of planting trees 25 feet apart on both sides of 1.2 miles of street, say, on Cote des Neiges Road from Sherbrooke Street to the entrance to the cemetery. It is as much as the city pays in a year to nine hospitals.

"It would buy 2,600 books for the civic library, and is equal in value to 10,760 gallons of milk, sufficient to feed 120 children.

The Serious Waste

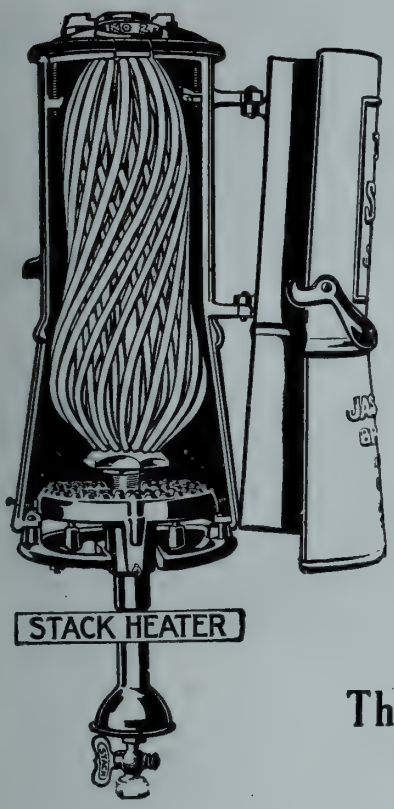
"If the running tap is one-sixteenth open, the figures mount tremendously. Such a tap wastes 668 gallons a day, 4,676 gallons a week, or 243,152 gallons a year. A thousand such taps require for pumping 559 tons of coal and $17,020 in salaries. The waste equals 14 cars of coal, the wages of 17 policemen or firemen, and would pave St. Catherine Street from Metcalf Street to Phillips Square. It would plant trees in the manner above mentioned for four miles. It is as much as the civic grant in a year to 17 hospitals. It would buy 8,500 books for the library. It is as much in value as 34,050 gallons of milk, food for 372 babies.

Then, If Open More—Read!

"If the tap is turned on one-eighth, the wastage of water becomes still more alarming. It reaches 2,330 gallons per day, 13,612 gallons per week, or 811,865 gallons per year. To pump this amount for 1,000 taps demands 1,868 tons of coal, and costs $56,811 in salaries. The loss represents 47 tons of coal, the wages of 56 police or firemen, the paving of 18,000 square yards of street. It would plant with trees twelve miles of street. It would represent city grants to 17 hospitals, 6 dispensaries, 9 homes for the aged or children, 6 refuges, and 34 miscellaneous institutions. It would buy 28,400 books for the library, or buy 113,622 gallons of milk, enough to feed 1,244 children for a year.

"Turned on one-quarter, that wasteful tap would lose 7.632 gallons per hour, 53,222 per week, 2.767,564 per year, a pumpage that would require 6,336 tons of coal, and cost $193,729 in wages.

"If turned on full, the amount of water wasted would be 20,160 gallons per hour, 131,120 per week, and 7,338,240 gallons a year. This, estimated on the 1,000-tap basis, would consume 16,877 tons of coal in pumping, and cost $573,677 in salaries."



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In the Stack Heater the gas flame circles about the almost perpendicular copper tubes. The whole surface of these tubes is exposed to the heat—a vastly greater heating surface than is found in any other heater.

It will be easy for you to explain this to your customer and to convince him that a number of small columns of water exposed to the flame on all sides will heat much more quickly and economically than one large column heated from one point only.

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HIGH GRADE RUBBER PUMP **2 in 1** FLEXIBLE BRONZE WIRE SPRING

For use as Plumbers Friend

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CHATHAM, ONTARIO



Mr. Behind the Time's Factory



Mr. Up to Date's Plant

THE OLD WAY

Cups Covered with Microbes, Disease Germs, etc.

Does this picture illustrate your shop? Are your employees drinking water out of rusty old cups? If so, you are doing them, as well as yourself, an injustice.

Drinking cups are unsanitary. They spread disease among your help, disable your organization.

Every time a man is sick, your production is cut down. Consider that fact!

"PURO" is a guard against sickness. IT'S SANITARY. The only drinking fountain having a bowl that prevents your lips touching the bubbler.

Then, too, "PURO" is a time and water saver.

With it you save 60% of the employees' time ordinarily wasted; also, as well as 35% of metered water—they do not hang around and talk as when the cup is in use.

In the "PURO" way the water is turned off the instant the bubbler handle is released.

PURO Patented (MADE IN CANADA) **SANITARY DRINKING FOUNTAIN**

THE "PURO" WAY

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The efficiency of your plant depends upon eliminating just such leakages as these.

The General Electric Company and many other big manufacturers are now using "PURO" in their shops.

"PURO" fulfills all state law requirements. It's easily attached. Simply unscrew the faucet and put on "PURO."

How many employees have you whose time is wasted?

IMPORTANT Our advertising is going to help more than ever to boost sales for "PURO" and you should take advantage of it to get your share of these sales. Write us to-day for full information. What are you doing?

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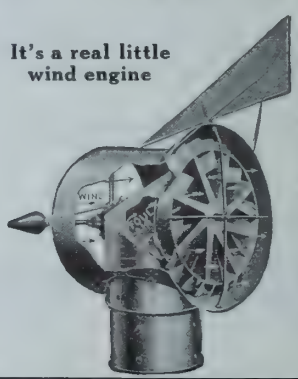
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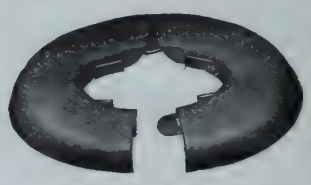


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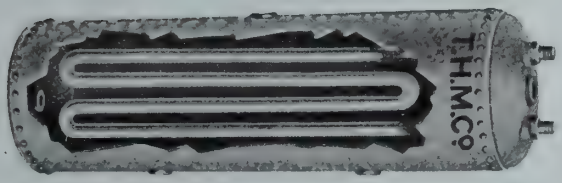
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No. 5 cuts from ½″ to 2″
No. 10 cuts from 2½″ to 4″
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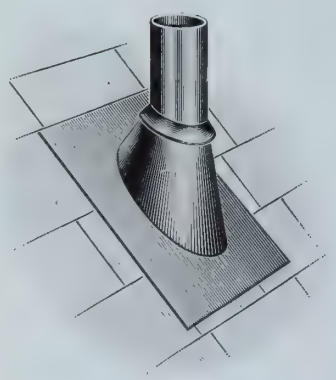
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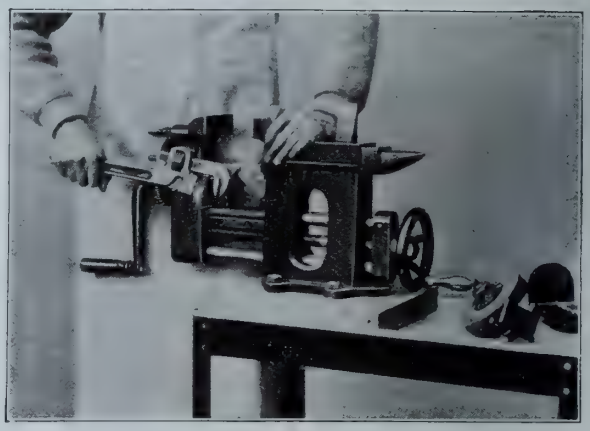
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TECHNICAL BOOK DEPARTMENT

MacLean Publishing Co., 143-153 University Ave., **Toronto**

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Thousands of Shrewd Fitters Have Discovered a NEW WAY to Make MORE MONEY!

THEY used to tear down a leaky or cracked boiler—waste time—perhaps wait a week or more for new sections—keep the customer in the cold—send a big bill—and **at that** not make very much profit!

Now—they simply pour "X" Liquid into the boiler. No welding—no dismantling—nothing to take apart. In 30 MINUTES THE JOB IS DONE! The cost is from $6 to $10. They get a GOOD price for the job—and **the customer** is perfectly satisfied. **"X" Liquid enables these fitters to do more work every day.**

"X" IS A PURE LIQUID. It is poured into the boiler and combines with the water. In sizzling out through the leak or crack the "X" is changed instantly into a solid, making a **permanent repair.** You don't have to know where the trouble is. "X" finds the leak or crack—and repairs it automatically.

The surplus "X" that remains in the water **prevents rust and scale.** "X" is not a cement or powder. Cannot clog air valves.

YOU OWE IT TO YOURSELF TO TRY "X." YOU CAN'T LOSE. "X" IS GUARANTEED TO WORK OR YOUR MONEY WILL BE RETURNED.

"X" *The Wonderful* BOILER LIQUID

$6 WORTH WILL DO A $100 REPAIR JOB IN 30 MINUTES.

"X" LIQUID IS USED BY

Pierce, Butler & Pierce, U.S. Radiator, Richardson & Boynton, Federal Radiator Co., General Electric Company, U.S. Government, National Radiator Co., Standard Sanitary Co., Crane Co., Gurney Heater Co., and many thousands of progressive steamfitters.

Your jobber will order it for you—or we will ship direct. Write for trade discounts—NOW!

"X" Laboratories

636 Washington St. - BOSTON, MASS.

King Boilers get up heat quickly

Very shortly after the fire is lighted in a King Boiler hot water reaches the radiators. The thin, peculiarly shaped waterways in the "King" mean quickly heated water and perfect circulation. The perfect circulation causes a saving in fuel because it obviates the necessity of "extra firing" to move cold water from the radiators.

The Trade should use this quick-heating, fuel-saving argument now while fuel is scarce and high in price.



WRITE US FOR PRICES

Steel and Radiation, Limited

Head Office, FRASER AVENUE, TORONTO

304 University Street, MONTREAL **101 St. John Street, QUEBEC**

AGENCIES IN ALL LEADING CITIES

WROUGHT PIPE

BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES

Black and Galvanized All Sizes

Ask your jobber for CT Brand

CANADIAN TUBE & IRON CO., LIMITED

Montreal Works: Lachine, Can.

After the War——What?

The time to put on fire insurance is before the fire. The time to prepare for after-the-war conditions is before peace comes.

Advertise now and be prepared to keep your goods in demand through the medium of SANITARY ENGINEER.

Lowering the Cost of Getting Orders

THEY were talking about the high cost of getting orders—were Brown and Jones. They were agreed on some things: train service was interfering with ability of salesmen to call on as many as formerly; hotel bills were adding heavily to the weekly expenses of salesmen; congested freight and express service was interfering with quick deliveries; salaries of men were going up; labor of all sorts, as well as materials, was becoming higher-priced.

Then Brown said: "I am giving a good deal of thought to the training of my salesmen. I am endeavoring to make them produce more business—to sell more goods, and to reduce the number of futile calls. I notice that they are giving much attention to this subject in the United States, and that in Canada some firms are paying serious attention to this matter of better salesmanship."

"What are you doing?" said Jones.

"Well, I haven't done a great deal so far, for I am in the initial stages of my studies. But one thing I have learned: it is that my men haven't been analyzing the causes of their failures to make sales. I can't blame them, for I myself haven't troubled myself to dig into this phase of the selling game. Now I am asking myself and my men—Why the failure to get the order?

"I have discovered a good deal. One thing is that my men haven't known enough about the goods they took out to demonstrate them convincingly. This is largely our fault. So we are using time and printed matter to make our men know exactly what they have to offer.

"Another thing we have had impressed on us is that our men haven't been approaching their prospects always in the best way. They have been too keen to sell rather than to serve.

"I saw a thing the other day that is good—by a man named Casson. He said the average salesman's method was "Talk—Argue—Compel.' As against this, he recommended: Listen—Agree—Oblige.

"What he means is that the salesman must get on the side of the buyer if he is to have best results. And so I am doing something to get my men trained to acquire the point of view of the man they canvass—this first. When a salesman postpones his sales talk until he has won the interest and attention of the prospect, he is in a much more favorable position to put across his proposal.

"I read recently an advertisement of the FINANCIAL POST in which it told of Frank Mutton, President of the International Business Machines Company, in which he said that he has subscribed to THE POST for each of his salesmen in order that they may be well informed about business conditions and affairs in Canada—this as an aid in making sales. The idea, I infer, is to make his men quick to get the point of view of the men they are to canvass—to become possessed of a kind and amount of information which will enable them to make themselves interesting to prospective buyers of time-recording machines.

"Now, I have known Mutton for many years—known him to be a super-salesman. In subscribing to THE POST for his salesmen, I saw one of his methods—secrets, if you like. So I got THE POST myself to see how my men could make use of it for the same objects.

"I have subscribed to THE POST for 4 months at the cost of a dollar per salesman, and I have been having my men report to me in writing just how they are finding The POST useful to them. They read THE POST with one question uppermost: What item or article in this issue can be used by me to help me make sales?

"I want to tell you, Jones, that I am delighted with the experiment. The minds of my men have been stimulated. They are "cashing in" on what they read. They relate certain items or articles to certain prospects, and they are approaching their customers with greater confidence, greater art, and with more persistency, born of a surer knowledge of how our product is worth the other man's consideration and purchase.

"My men are bringing in more business, and this offsets the increasing costs of going after business."

* * * *

A VERY suggestive conversation, is it not? The point of its reproduction here: If you think the idea put into operation by Brown (and Mutton who is paying for 50 subscriptions for men in his employ) is worth your consideration, then investigate THE POST for yourself. Instruct us to send THE POST to you that you may investigate it from the angle—What is there in this paper that my men can use to help them "get next" their prospects with a view to making more sales and in quicker time?

So we suggest to you that you sign the coupon below.

Just what does the FINANCIAL POST aim to do? The answer is: It gives business men information about every important happening in every part of Canada as this happening relates to Business. It follows the various listed and unlisted securities, and gives each week clear and accurate and up-to-the-minute information about them. It tells about the movements and influences affecting such groups of investment interests as Iron and Steel, Textiles, Milling, Pulp and Paper, Transportation, and so on. It has numerous contributed articles of first-class interest and importance. It contains much personal matter—notes and sketches about men of influence or position in the public eye whose doings or sayings have relation to Business. Withal, THE POST is extremely readable. It is edited and prepared by trained journalists—the highest-priced staff of men on any publication in Canada. All this makes THE POST a "different" paper, and a good one. The subscription price is $3.00 (52 issues—Saturdays); or 4 months for one dollar.

The MacLean Publishing Company, Ltd.,
143-153 University Avenue, Toronto.

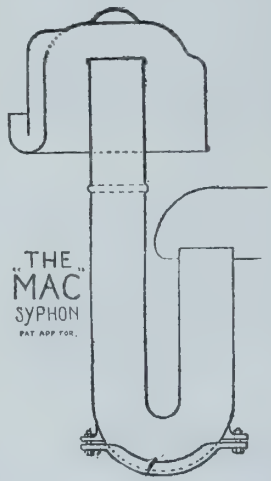
Send me / us THE FINANCIAL POST (weekly, every Saturday). Subscription price of $3 will be remitted on receipt of invoice in the usual way. Have addressed to

.....

S.E. .....

Specify the Original "MAC" Syphon

If you are interested in the only real method of sanitary sewage disposal you will need to use a syphon.



We are the sole manufacturers and patentees of the original MAC syphon and are in a position to supply you from stock. Every order we receive is shipped the same day.

Every syphon guaranteed to work automatically once it is primed.

Made in two sizes—3 in. and 5 in. Prices on application.

3 inch syphon discharges 90 gals. per minute.

5 inch syphon discharges 260 gals. per minute.

We have a full line of soil pipe and fittings.

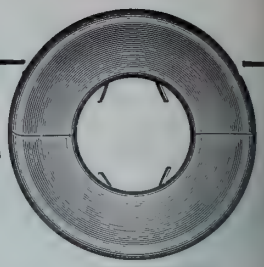
West Toronto Foundry Company

Cor. of Mulock and Junction West Toronto



OPEN VIEW NO. 10-A.

The CEILING PLATE that's better



TOP VIEW NO. 10-A.

THE NO. 10—A NARROW FLANGE PLATE IS A STEEL HINGED PLATE. FLANGES ¾" WIDE. HIGHLY FINISHED. ESPECIALLY DESIGNED FOR TWIN CONNECTION "NARROW."



Gem No. 4.

The split ceiling plate is coming more and more into use than ever and ALWAYS GIVES A NICE FINISH, because it can be attached to mains and risers at the very last, and is not exposed during completion of a building on the floors.

High quality at the right price.

Gem No. 4 Automatic Air Valve

Made from the best brass obtainable. Pressed shell and pressed brass base which eliminate danger from blowholes, which is a fault with cast bases.

Write for catalog showing our complete line of specialties.

The BEATON & CADWELL MANUFACTURING Co.

New Britain, Conn.

Eastern Agent: J. R. Devereux & Co., 358 Beaver Hall Square, Montreal. Western Agent: A. E. Hinds & Co., Chamber of Commerce, Winnipeg.

Kindly Mention this Paper when Writing to Advertisers.

World-Famed Specimens of the Age of Steel

T R I M O



WITH FLAT-LINK OR CABLE CHAIN



T O O L S

Send for Catalog No. 91

MADE BY

TRIMONT MFG. CO., 55 Amory St., Roxbury, Mass., U.S.A.



The best advertising you can get is to satisfy your customers and the most exacting customer will be thoroughly pleased with the quiet operation of the

TRADE SILENTFILL MARK

NO NOISE.

MANUFACTURED BY

CALLOW & PHILLIPS

40-42 Lombard St., Toronto, Can.

Telephone Main 2016

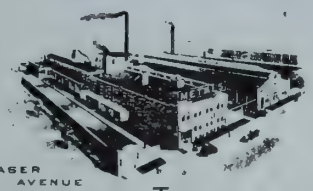
A WORD TO OUR ADVERTISERS

THE CANADA METAL CO. LIMITED

MANUFACTURERS

BABBITT
BATTERY ZINCS
SOLDER
PIG LEAD
LEAD PIPE
ANTIMONY

CABLE ADDRESS CAMETO
ADDRESS ALL COMMUNICATIONS TO THE COMPANY
TELEPHONE PARKDALE 76
CONNECT NO ALL DEPARTMENTS



FRASER AVENUE

AND IMPORTERS

INGOT TIN
STEREOTYPE
AND ALL
WHITE METAL
MIXTURES
DIE CASTING

TORONTO Mar. 25, 1918.

Editor,
Sanitary Engineer Pub. Co.,
University Ave.,
City.

Dear Sir-

You may be interested to know that we have this day received a suggested name for our new Laundry Tub from Sgt. J.H. Kelly, Canadian Engineers, "Somewhere in France", who states he was a master plumber and in business for eighteen years in Canada.

In his letter he further adds that he has just received a copy of the Sanitary Engineer and noticed our advertisement in reference to the Victory Bonds for suggesting a name for our new Laundry Tub.

We give you this information thinking you might be interested to know how even some of the old Sanitary Engineers like to keep in touch with trade conditions through various Trade Journals, even though they are fighting for King and Country.

We might further add that we had hundreds of replies from all parts of the Dominion of Canada.

Yours truly,
THE CANADA METAL CO. LTD.
Per- H C Crow

ECO.M

JUST READ THE ABOVE

THE question often arises in an advertiser's mind as to whether the readers of a trade journal "do really read the advertisements."

We know that, in the case of subscribers to SANITARY ENGINEER they do. We know, because we have all kinds of inquiries ourselves as to whether "So-and-So's" goods will do such and such a thing, etc.

We know because we have proof from our own advertisers. Our best references are our advertisers, and when we want any recommendation, we invariably call upon them.

H. G. WELLS

says in APRIL MACLEAN'S that peace is not going to be made in the old way—not by great moustached heroes, frowning and drawing lines with black soldierly thumb-nails across maps—not by bargaining and bullying and table-banging. All the essential terms he declares will be stated and accepted in the sight of all mankind before even an armistice occurs. A BIG ARTICLE—A GRIPPING ARTICLE, by the greatest of present-day writers, entitled:

"The League of Free Nations"

OTHER FEATURES OF THIS NUMBER ARE

John Bayne Maclean, in one of his sensational articles on the War, "Suppressing the Truth."

Robert W. Service, in a strong War poem, "The Blood-Red Fourragere."

Agnes C. Laut, in "Labor Will Unmask the Kaiser."

BRIGHT AND GRIPPING STORIES BY

ARTHUR STRINGER
ALAN SULLIVAN
E. PHILLIPS OPPENHEIM
A. C. ALLENSON

APRIL
MACLEAN'S

"THE MOST TALKED-OF PUBLICATION IN CANADA"

20 Cents **At All News Stands**

MALLEABLE AND CAST IRON PIPE FITTINGS

THE BRAND THAT HAS THE QUALITY

MADE IN CANADA

DEPENDABLE CAST IRON AND MALLEABLE FITTINGS

are the biggest asset to sanitary and heating engineers.

No time lost in making up pipe lines. All our fittings are properly recessed, both cast iron and malleable, and every fitting bears the above trade-mark of quality.

We make a full line both flanged and threaded fittings from ⅛-in. up, and can make deliveries from stock, both standard and extra heavy.

When ordering from your jobber don't merely order "fittings"—there's a difference. See that you specify the IM brand only.

INTERNATIONAL MALLEABLE IRON COMPANY, LIMITED

GUELPH, ONTARIO, CANADA

Aylmer

HAND SYSTEMS

With the Aylmer 520 Pumps can be depended upon to give absolute satisfaction under all conditions.

MANUFACTURED BY ONE OF CANADA'S OLDEST PUMP CONCERNS

WRITE TO-DAY FOR PRICES THEY ARE INTERESTING

AYLMER PUMP & SCALE CO.

Aylmer - - - - Ontario

STANDARD OF CANADA



There Are Lots of Gate Valves



advertised and sold, but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.

Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.

Approved by the Fire Underwriters Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario

THE LINE OF BOILERS
YOU'LL EVENTUALLY BUY



HIGH BASE

SAFFORD MOGUL ROUND
Hot-Water Boilers

We have customers who after having tried out and installed every make of Canadian heating boilers have finally "taken on" the SAFFORD MOGUL, to the greatest satisfaction of their customers.

We never lose a Safford man unless his credit is bad. He knows by experience that our boilers will stand up and give the most efficient service of any boilers on the market. We are modest in our ratings. Each of our Mogul Hot Water Boilers will carry its full rating of direct radiation in addition to the mains.

The ratings of our water boilers are based on a temperature of 180 degrees in the water at the boiler for a period of eight hours on one full charging of fuel, during which only 80 per cent. of it is consumed, leaving a balance of 20% for a re-kindling reserve.

DRCo

The Dominion Radiator Company Limited

Hamilton, Ont.
St. John, N.B.
Calgary, Alta.

TORONTO
OTTAWA

Montreal, Que.
Winnipeg, Man.
Vancouver, B.C.

DRCo

WRITE US FOR "THE DOMINION FITTER" IF YOU HAVE NOT GOT A COPY

VITRO - NO - TROUBLE

EVERY FITTING TESTED *EVERY TANK GUARANTEED*

VitrO Oak Combination



Plate C101

MANUFACTURED BY

GALT BRASS COMPANY, LIMITED

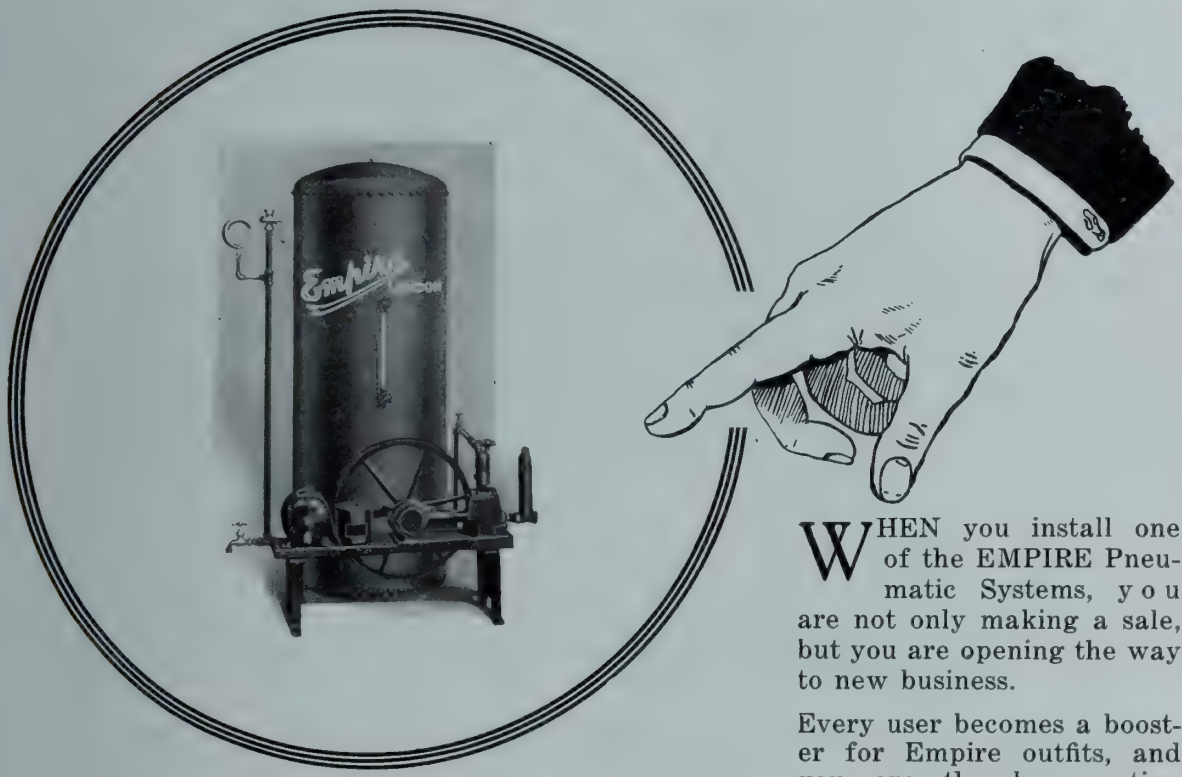
GALT -:- -:- ONTARIO

SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

Vol. XII. Publication Office, Toronto, May 1, 1918 No. 9

EMPIRE WATER SYSTEMS
CREATE NEW BUSINESS



WHEN you install one of the EMPIRE Pneumatic Systems, you are not only making a sale, but you are opening the way to new business.

Every user becomes a booster for Empire outfits, and you are thereby creating more and better business for other sanitary appliances.

LET us send you one of our booklets describing EMPIRE Systems. It contains some useful data regarding the capacity, installation, etc. Our systems can be procured in many sizes, electric or engine-driven or hand operated. Every part is fully tested and tried before leaving the factory, and every piece is interchangeable.

We can make prompt deliveries. **Write us for prices.**

EMPIRE MANUFACTURING CO., LIMITED

LONDON TORONTO

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While



A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for BEAVER BRAND CAST IRON ENAMEL WARE

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

ONTARIO:
Monarch Brass Mfg. Co., 71 Brown St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes, 120 Lombard St., Winnipeg

Made in Canada



Made in Canada

Everything in Rubber

There is hardly a rubber need that the Dominion Rubber System cannot supply. *"Everything in rubber"* is a reality with us. Not only is our line complete, but values are the best within your reach.

Behind all is the Dominion Rubber System service. Branches in all the principal cities in Canada make it possible for you to secure deliveries on the shortest notice.

Put us to the test and judge for yourself how complete and satisfactory our service really is.

Canadian Consolidated Rubber Co. Limited

HEAD OFFICE - MONTREAL

Branches at Halifax, St. John, Quebec, Ottawa, Toronto, Hamilton, Kitchener, London, North Bay, Fort William, Winnipeg, Brandon, Regina, Saskatoon, Calgary, Lethbridge, Edmonton, Vancouver and Victoria.

Our aim is to serve and please



One shipment of
14 600-H.P. Machines

FARNSWORTH machines drain lines, systems, apparatus, etc., under any known condition, holds the condensate under pressure, which conserves the heat units and feeds it directly into the boiler under H.P. or L.P. Hundreds of machines feeding boilers at 300 degrees.

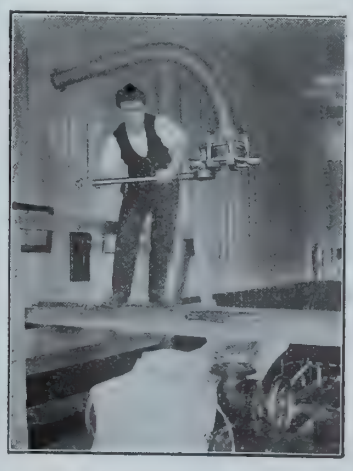
Send for our catalogue describing 12 styles of machines and showing 25 line drawings of systems, etc., explaining how our machines correct bad conditions and save your coal.

FARNSWORTH COMPANY

Conshohocken, Penn.

PIPE THREADING TOOLS

It is Evidence Like This



"Toledo" Geared Adjustable Threading Tool No. 2 making a cut and thread on a 4-inch bend in position. It was desired to install a steam separator above throttle of engine, and the whole job was satisfactorily completed without removing the pipe line.

which proves the extra value of "Jardine" and "Toledo" Pipe Threading Tools

"Jardine" and "Toledo" Pipe-Threading Tools cut clean, sharp threads with a minimum of muscular effort. They permit of one man doing work which ordinarily requires two. But even more important than this, they will work in any odd corner. Instance the job illustrated in the accompanying engraving. Here is a case where, with an ordinary tool, the whole pipe line would have had to be taken down. The tool paid for itself on that one job.

Investigate "Jardine" and "Toledo" Tools yourself. Ask us to send names of users in your locality. Then go and talk to these men in your own business and learn what they think of these good tools.

A. B. JARDINE & CO., Limited, Hespeler, Ont.

Sole makers of "Jardine" Pipe-Threading Tools.
Sole licensees to manufacture and sell Toledo Pipe-Threading Tools in Canada.
Agents, Winnipeg and West—Stanley Brock, Ltd., Winnipeg, Man.
Brockville and East—J. R. Devereux, 358 Beaver Hall Square, Montreal.
Belleville and West—W. H. Cunningham, 98 Kingswood Road, Toronto, Ont.

"WOLVERINE" KANTLEAK FLOATS "WOLVERINE" KANTLEAK

Absolutely Solderless—Heavy Copper.

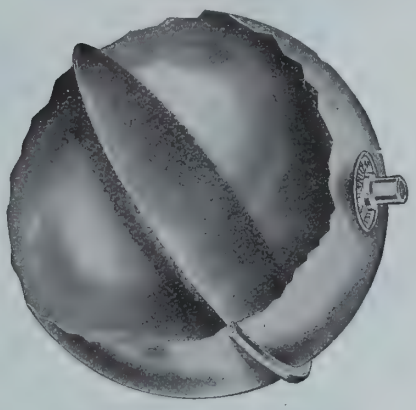
RED BRASS CAST SPUDS are swedged on the inside to withstand acid or alkali waters





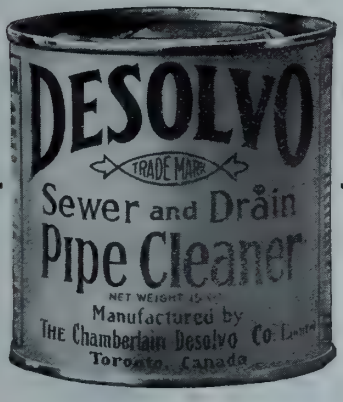
"C" Catalog "C"

LOCATION OF SPUD prevents Seam from Striking and denting lining of Tanks.



Canadian Wolverine Company Ltd.

Chatham, Ontario.



STOP

tearing up floors, tiling or digging up lawns to reach clogged pipes.

USE

DESOLVO

AND COLD WATER

It does the trick quickly and thoroughly, to the entire satisfaction of both the plumber and houseowner.

DESOLVO is the **Only** pipe solvent that can be used successfully with cold water. It generates its own heat—an extremely high temperature—and dissolves all soluble matter without injury to pipes or plumbing.

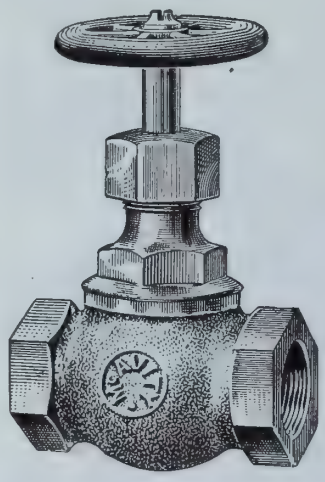
DESOLVO is the **Original** pipe cleaner and stands supreme in its field.

If you have not used DESOLVO, write us to-day on your letterhead for **free** trial can.

The Chamberlain Desolvo Co. Ltd., 110 Church St., Toronto

Mention Your Jobber's Name

We have yet to see a Better Valve than the



"McAvity" VALVE

Every Valve packed and tested before leaving factory.

Let us quote you a quantity price. Prompt shipment from stock.

T. McAVITY & SONS, Limited

Montreal **ST. JOHN, N.B.** **Winnipeg**

Joseph Breeden & Co., Ltd.

NEW MILL WORKS

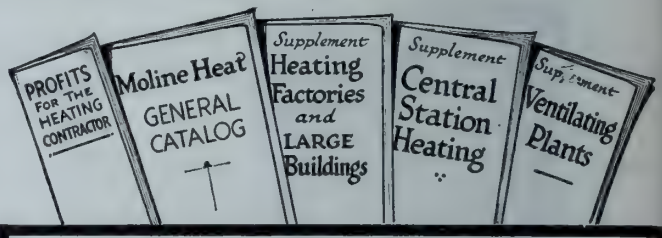
Fazeley Street, Birmingham, England



MANUFACTURERS OF

HIGH CLASS

Steam and Water Fittings



These Valuable Books *Free!*

Each one is worth big money to you. Every heating contractor should have them. They cover all the latest money-making ideas in figuring and installing steam heat—hot water heat—vapor heat—and vacuum systems.

These books will help you to land more orders and increase your profit on every job. Write for them at once. They are absolutely ***FREE!***



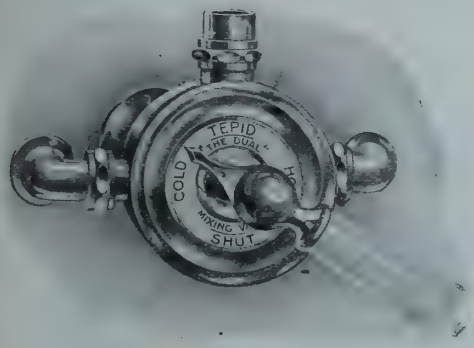
Moline **Illinois**

G. & W. G. GUMMER, LIMITED

EFFINGHAM BRASS WORKS,

And at
9 Fenchurch St.,
London

ROTHERHAM,
ENGLAND



"Dual" Mixer

A valve that really mixes Hot and Cold Water, and maintains a uniform mixture.

For ease of operation, simple construction and easy installation, it has set a new standard of efficiency.

Cold Water must be turned on first, no possibility of scalding.

Made in several forms for Showers, Sprays, Operating Rooms, etc.

At the well-known works of Messrs. Brunner, Mond & Co. these valves provide baths for 2,500 employees.



G. & W. G. GUMMER, LIMITED

Manufacturers of every description of

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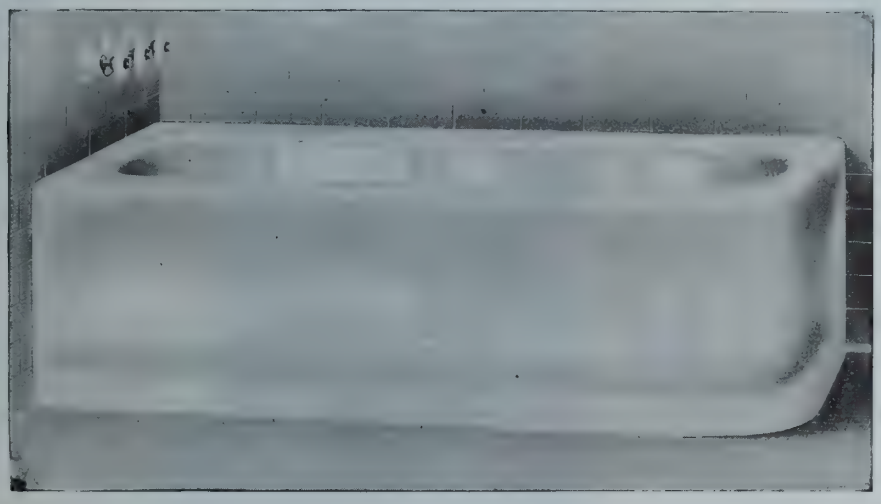
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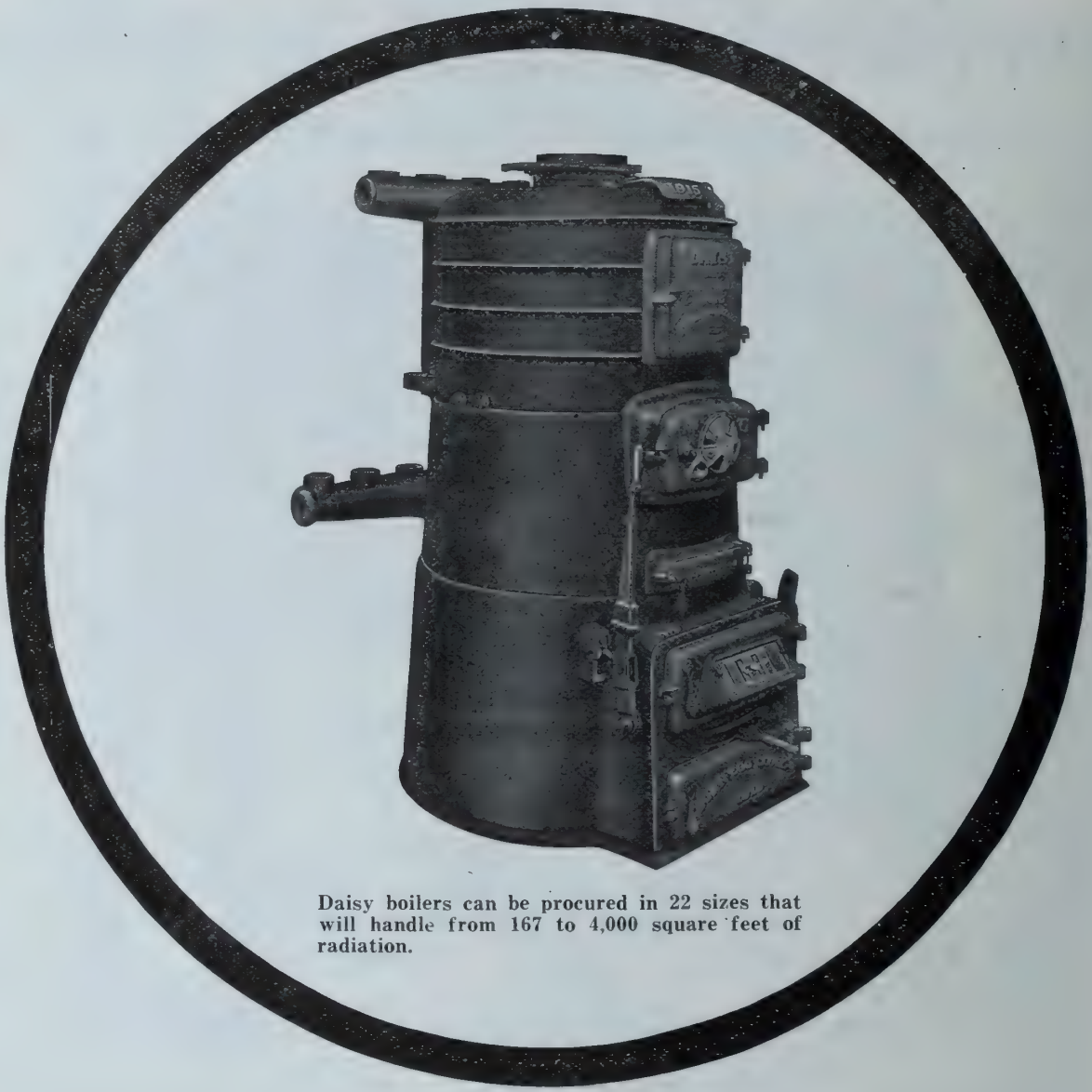
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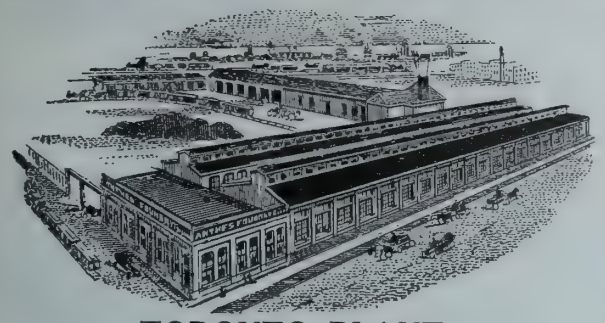
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SANITARY ENGINEER
PLUMBER AND STEAMFITTER OF CANADA

Vol. XII. TORONTO, MAY 1, 1918 No. 9

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EDITORIALS

The Public Welfare Essential—How to Reduce Fire Loss

The MacLean Publishing Co., Limited

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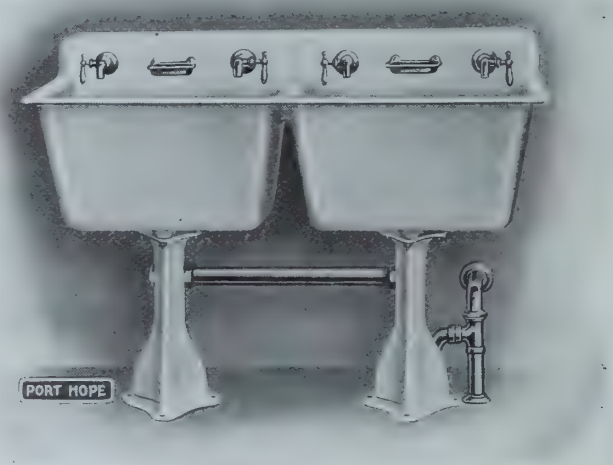
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SANITARY ENGINEER

VOL. XII MAY 1, 1918 No. 9

Value of Pneumatic Water Systems

Hundreds of Fires in Small Towns and Villages Where There is no Public Water Works Could be Put Out—Scope For Sale of Pneumatic Water Systems Almost Unlimited

ALMOST every day there are fires reported which cause a lot of damage, families are rendered homeless, and in many cases lives are lost. This should not be in these days of progress, and there should be a law put into force that would make some one criminally responsible for such calamities.

Every year lives are lost, property is destroyed and towns are in danger of being entirely wiped out, all of which is sheer careless neglect, and if every home were provided with some form of fire-fighting appliance, however small, no doubt the greater proportion of these fires would be eliminated.

Or, if when a village, town or even township became incorporated, and there existed some law which required a fire-fighting equipment to be kept in working order, the cost of same would very soon prove to be the best investment.

One thing is certain, every home or building where fires, or some form of naked lights are used, is little better than a fire trap, and it would not be so bad if it were not for the fact that fires once started very often spread, as was evidently the case reported and shown in the accompanying panel which is a clipping from a daily paper, *The Toronto Globe*:

Here is a small town, a cotton mill and no doubt several other industries; people are living in houses where no protection from fire exists; the nearest fire-fighting appliances several miles away, and $30,000 damage done. No mention of any insurance is made, but it is to be hoped that the families that are rendered homeless did at least carry some insuranre on their possessions, though the best insurance of all is prevention.

Now, suppose there had been one or two pneumatic water systems in the vicinity, or even in some of the houses that were destroyed. There would have been a chance of the fire being extinguished before it had gotten such a hold, and such being the case, there is business waiting the picking up by sanitary and heating engineers.

Every town or village in Canada is teeming with business of this kind, and apart from this the sale of pneumatic water systems would prove a boon to

Fifteen Families Left Homeless

TEN DWELLINGS DESTROYED.

Fire at Marysville, N.B., Leaves Fifteen Families Homeless.

(Canadian Press Despatch.)

Fredericton, N.B., April 21.—Fire originating in a house occupied by Garfield Petterson, Marysville, at 9.30 yesterday morning wiped out ten dwellings in the section known as Sandyville. The homes destroyed were occupied by operatives of the Canadian Cotton Mills. There was no water supply there for fire fighting, and the auto-chemical truck from this city was summoned.

Fifteen families are left homeless, most of them losing everything they possessed.

The business section of the town was threatened at one time, but prompt methods saved serious destruction. The loss is estimated at $30,000.

Sheer, Careless, Neglect

the owners. Just imagine, instead of Marysville having fifteen homeless families, costing $30,000, and the rest of the town being jeopardized, over 100 power-driven pneumatic systems could have been bought and installed for less money, and the buildings saved.

Then there's another viewpoint. Look at the service that could be rendered to a community, water on tap 24 hours a day, winter and summer, and practically no upkeep, or even a small central pneumatic water system could have been acquired and paid for with interest in less than 10 years at a much less cost than $30,000. We in Canada are having far too many fires.

In fact, according to the 1917 report of the Commission of Conservation, the value of buildings lost by fire amounted to $21,500,000 in the year 1914. But while this figure per capita, divided amongst 8,000,000 population, may not appear to be large, its significance is more clearly realized when we find that the total value of buildings erected in that year was $91,000,000, thus showing that out of over $4,000, $1,000 worth of buildings or property was burned up.

The loss in Canada which is due to fire is a tax on all classes of industry, and is severely felt in rural districts and small towns. The burden of the loss has to be borne directly or indirectly by every citizen.

In proportion as the risk of fire is greater, the cost of insurance has to be increased. Although buildings are more scattered in country districts, they are, for that very reason, less satisfactorily provided with water supply under pressure.

This is, too, all the more reason why some form of pneumatic water system should be installed in those isolated homes.

It is strange, but nevertheless true, that although water is the very first essential in any home, and in cities and towns is almost one of the first matters to be dealt with, yet in a rural home, an open creek, a spring or a pool appears to be the average supply.

The consequence is big fire losses and high insurance rates have to be paid upon all such isolated buildings.

It is too bad that people are allowed to build houses in such haphazard ways. making no provision for fire protection and sanitation. It would be a safe statement to make that without doubt there are a great many more deaths in Canada as a result of preventable diseases and life lost by fires than this war will have cost us in life and limb. Yet nothing is apparently being done to remedy matters.

Some time ago one or two of Toronto's city aldermen stated that people were being inspected to death. But if there were more rigid laws, and more practical inspections made of both rural and city buildings, very much less loss would result, and we can buy a lot of "inspection" for twenty-one million dollars a year.

With such figures as here given it should appear to be quite clear to every practical sanitary and heating engineer that there is great opportunity for the sale of pneumatic water systems and plumbing goods among rural residents and farmers. And apart from the financial benefits derived from such sales, every sale made also makes the country safer or freer from fire losses and high insurance rates. Every fire or at least 95 per cent. are the direct result of sheer carelessness, and every Canadian citizen pays his or her quota of the loss. Then the duty to each citizen is clearly plain.

Sizes of Soil, Waste, Drain & Vent Pipes

How Shall We Compute Sizes of Soil, Waste, Drain and Vent Pipes?—Is the number of Fixtures on a Stack of Any Importance? — Some Very Revolutionary Theories Set Forth Which Deserve Serious Consideration

By Horace Nixon.

BY Fig. 3 in my former paper I am going to try to demonstrate that main and branch soil pipes are most times larger than they should be, and that although the number of fixtures is not a negligible factor, that factor is mostly used in an improper manner.

Take the branch from a battery of closets, and given 3 feet centres (and they should never be less) and Y's laid flat, as they should be, the 4-inch bend, ferrule, Y, and the portion of the main branch between each Y of four-inch pipe will hold the discharge from its own closet, even when a battery of forty or fifty are dumped at the same time, but each one must be vented from as near the top of the bend as possible, as I have shown in my rough diagrammatic sketch.

This venting is also necessary to prevent the corrosion of the top of the bend by sewage gas, of which I have found more than one instance in this new city, and this action must be allowed for and prevented; the saving can be made on the main stack and branches, which will be kept cleaner for being smaller. The other point I wish to illustrate is this, that it is not always necessary to have a stack of a larger diameter, because there is more than one branch, though it sometimes is, and my argument is this: that by using a by-pass or air-relief connection between the main soil stack and the main vent stack the discharge, shown as having come from the second floor above, compression being thereby removed, will be a plug of water travelling at the rate of at least twenty-five feet per second, and will take along with it the discharge coming from the lower branch, and though it will be for a few seconds slightly retarded, it will impel the other forward with it, and soon attain an even greater velocity, unless checked by friction or some other force, or a combination of the two forces.

Now, I believe I have said enough to show practical men that by proper calculation much expense can be saved in plumbing installations, not only without impairment, but with much improvement.

But how are we going to get these things righted in the face of the tables of sizes of pipes that most plumbing ordinances contain, and in the face of the plumbing inspector, who says, "Live up to the by-law?"

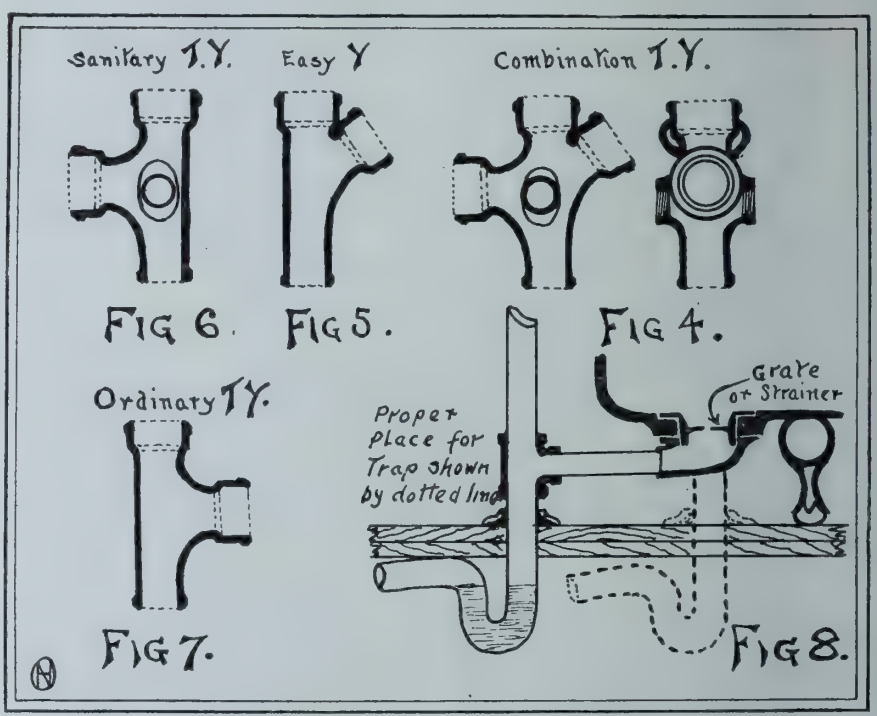
And most inspectors, perhaps feeling their own incompetency to rule in these matters, are very rigid in seeing that every little thing is explicitly specified. It's a delicate situation, but it must be dealt with, and a solution arrived at, and the men to work out that solution are the practical men among the plumbing inspectors; all of them have not gained their office by virtue of their political or secret society affiliations; some of them have both the intelligence and the knowledge to deal with these questions, and some have the courage and honesty of purpose to take the responsibility of giving a special ruling to suit a particular case.

All of these qualities are necessary in our inspectors, if the public who pay are not to be put to unnecessary expense; and those inspectors that have not these qualifications should have to make way for those that have. I may have a few words to say about some inspectors, of whom I have recently learned, later on.

Now I wish to say a few words about the fittings shown in Fig. 2. They are only slight modifications of the standard fittings now in use, and if the manufacturers wish us to continue using cast iron pipes and fittings they must give us those modifications and also a few specials. The slight difference I show is that both the TY and the Y have no arridges or toes; they are curved away on both sides of the branches. A combination fitting that will come into general use in the near future I show as Fig. 4, which will be needed both right and left-handed. If the manufacturers cannot or do not care to cast a hub parallel to the four-inch on the two-inch side inlet, a tapped boss for two and a half inch and a street L would perhaps be even better, and if the elongated recessed inlet with the tapped boss were formed on both sides it would be the most useful fitting extant and would catch bath or sink branches coming from any or all points of the compass, the side not needed being plugged. It would be a real sanitary TY, and the one casting would be both right and left-handed; there would be cases where a relief vent would not be desirable, but where a clean-out (especially one that one could be sure of getting open and closing up again properly) would be a boon; the Y side could be used for that purpose when not needed for venting.

Now for a few words on the "Fiat" system, of which you print a description by Mr. Bateman in the February 1st issue, and which is better installed in the Chicago photo than in the diagram I notice. I refer to the way in which the basin waste is connected to the bath waste. If done the diagram way the bath waste would soon be choked.

Although it appears to be that abomination, a hybrid system, there are some good features shown in connection with it, the principal being the shortness of the untrapped waste on the local side of wash basin and sink traps, though it is a matter of opinion whether that compensates for the extremely long length of the water seal, it being double the average; personally I think it might, but



there is altogether too much fouled water held up in the case of the bath trap. Why use the drum at all? Also, why not take the pipe direct from beneath the overflow T to the special connection? The drum is quite unnecessary and useless as a clean-out.

Experience has taught many of us that the chokage of bath wastes is usually caused by hair catching around the overflow T, and we are now in Saskatoon installing our bath traps directly beneath our overflows as Fig. 8, and when necessary, through chokage, we take out the overflow, and we usually find the trouble right there. But why not go further and cut out the overflow? It's only an abomination, and if dispensed with, the top of the water seal of the trap would be only six inches away from the surface of the bath bottom instead of twelve.

But this is a digression. To return to the Fiat system, it is not, to my way of thinking, providing a good joint between the closet bend and the bowl, neither does it increase the flexibility in the direction that is most needed—that is, vertically, when the stacks are of wrought iron. We had the hybrid system, half Durham and half cast iron, in vogue here until the new provincial regulations swept it away.

The Durham waste system may be passably good, if properly installed, but I will venture to say that not above one pipe or nipple end in a hundred reach the shoulder of the fittings as designed to, but leave a very good lodgment for toothpicks, nails, hairpins, wire, etc., all of which the writer has seen taken from Durham wastes, and I do not believe the plumbers hereabouts are any worse than those at any other place.

"Cut out the overflow"; that is the expression I used above, and before closing this paper I would like to add my little mite to the agitation now going forward for the abolition of the overflow in plumbing fixtures.

Like other things that were considered necessary adjuncts to new contrivances, and have now outlived their usefulness, their day has passed and they must be cut out; they got fouled at every discharge; it is impossible to get at them to effectually cleanse them, and they impart a sourness to the atmosphere of the bathroom, that is unpleasant, to say the least of it, as well as unnecessary.

The elaborate plated standing wastes that add so much brightness to the bath chamber are the worst of all, as they present four times as much fouled surface to the air of the room, and plumbers, that are regularly doing repairs in bathrooms, could tell on entering a strange bathroom blindfolded if there were standing wastes to the fixtures by the peculiar odor therefrom.

The money saved by the elimination of the overflow can be better expended on the more efficient venting of the plumbing system, and there will be fewer flies bred in the bathroom. I am sure that most of the people who have these beautiful fixtures in their houses would be anxious to part with them if they were shown the interiors of them, and have something simpler and safer installed. We could then have waste outlets commensurable with our waste pipes and traps.

Since writing the previous part of this paper it has come to my knowledge that 3-inch stacks are no novelty on this continent, as they were generally used for ordinary dwelling houses, and sometimes for double houses in the City of Pullman, Ill., as much as twenty-five years ago. Washington, D.C., has also allowed 3-inch stacks and branches for single bathrooms for many years with favorable results.

The writer has installed 2½-inch stacks for single closets on either third or fourth floors, with satisfactory results, but in lead pipe.

I was hoping to add on to this paper a few remarks on the vagaries of plumbing inspection provisions, but am awaiting further information on this important subject.

Buckingham Palace Too Insanitary to Live In

An Interesting Article, Which Proved That the Drainage System Could Not Have Been of Cast Iron Pipe—There Will be no Ear Given to Clay Tile Arguments When Buckingham Palace is Made Sanitary

WHEN King George offered Buckingham Palace to the nation as a hospital, the authorities concerned forgot all about the old adage of not looking gift-horses in the mouth, and promptly started an investigation. The result was that the gift was declined, whether reluctantly or not, does not appear, on the ground that the palace was too insanitary to live in and would cost too much to make right. The drainage of the palace is worse than anything in "the ward," and a competent sanitary engineer would order it closed up. The late Prince Consort caught his typhoid fever there, of which he died in 1861; and as the Prince of Wales (King Edward VII.) nearly died of the same disease in 1871 it is possible the contagion came from the same source. Buckingham Palace stands on the site of many older edifices, none of which were erected with regard to sanitary considerations, and the soil on which it stands is said to be saturated with sewage. A huge sewer, draining St. George's Hospital, passes right under the palace, within a few feet of the floors of the cellar, and the emanations from this, if there were nothing else, would render the palace unfit to live in. Queen Victoria always insisted on this, and never would sleep in it, and complained of the bad air as giving her a headache. When compelled to attend court in the palace she always hastened away to Windsor as fast as possible. It will be remembered that the Duke of Clarence died early, and the present Prince Albert is another victim of miasmatic conditions. One might think there was a democratic conspiracy to kill off the reigning family by compelling them to reside in an insanitary house. The Queen Mother and King Edward lived for the most part at Sandringham and so escaped the noxious influences of Buckingham Palace. When the medical authorities refuse to allow the wounded soldiers to live there, it is probable that something may be done to change the conditions. This will certainly not be till after the war, but what is needed is to have the old rookery pulled down, the site disinfected, and a modern structure erected on it. No one would have regretted it, provided no one had been hurt, had a raider bombed the old palace to pieces.—Toronto *World*.

Just imagine how inconsistent our medical men can be and are. On the one hand we have medical men who will persist in trying to prove that sanitary plumbing and drainage systems are not matters which should be under the jurisdiction of the boards of health. They keep on harping that these matters are merely matters of construction, and only fit to be passed upon and inspected by the average building inspector. They state that typhoid diphtheria, measles, etc., are not caused by bad drainage odors. But not one has ever proved what is the origin of these diseases.

There are scores of towns and cities on this continent that are not one iota better than Buckingham Palace, and hundreds of thousands of dwellings in which clay tile pipes are laid that are sewage saturated holes at the foundation.

It ought to be criminal to allow manufacturers of clay tile pipe to advertise that clay tile pipe is the best and "permanent," etc., etc., and no self-respecting trade journal would allow its pages to be used for such a purpose.

There is no objection to clay tile pipe being used for a thousand and one purposes, but not for drains in the interior of a building, particularly where human beings spend most of their lives.

The city of Toronto has a reckoning day coming as sure as that the sun rises in the east and sets in the west. A city is only one big dwelling place, and every dwelling is a small unit of that city. So with evidence such as shown from time to time which proves that clay tile pipe is not proper material for the purpose named the public should be given the truth about the matter in question and have all town and city by-laws so drafted as to demand that no clay tile pipe be used inside the walls of a building, if such pipe is installed for the purpose of conveying sewage out to the main sewer.

How to Secure the Public's Good Will

Inefficient Work of Botchers and Incompetents the Chief Cause of Complaint—Public Willing to Pay For Good Work—Reason for Changes Must be Thoroughly Explained

By C. J. Morris

IN the previous article under the above heading reference was made to evidence which proved conclusively that a large number of those who had appropriated to their own use the desigation of plumber or sanitary engineer were quite incompetent and utterly unworthy to bear the self-bestowed name of what should be an honored and respected craft.

Further consideration of the matter tends to prove that this invasion of the craft by incompetents is probably responsible, more than any other single case whatever, for the ill repute in which the craft generally is held by the public.

By many it is quoted against the plumber that he wishes to make the craft a closed corporation and it is held by the public that his desire to do this is due to his wish to create a monopoly of the business and thereby, in forming so to speak, a corner in plumbers, to gain the power to make exorbitant charges for his work. This is another point upon which the public must be instructed by advertisement.

They must be shown that the craft have no desire to limit the number of its members, their only aim is to see that every one styling himself a plumber or sanitary engineer is at least competent to do a simple job and to prevent botchers and cheap jacks from foisting themselves upon the public as they have done in the past and as they are still doing. The public must be made to see that sanitary engineering is a science and that the efficient plumber is a skilled workman, the product of years of experience and learning.

How has it come about that the craft has become so infested with incompetents and men of an inferior moral standard? Is it not because the ne'er-do-well, looking round for a trade to adopt, has seen that the remuneration which a skilled plumber can command is somewhat higher than that in other trades, and has said to himself: "I'll be a plumber?"

This method of procedure may be all very well in some lines but it will not work in this calling. The average man with an ordinary amount of intelligence might make a passable attempt at carpentering. His work probably would not bear comparison with that of the skilled carpenter, but it would probably serve the purpose for which it was intended. This, however, is not the case with plumbing work which requires trained experience and special knowledge.

The man then who decides on taking up a trade such as carpentry, painting, paperhanging, etc., may possibly start without experience, and eventually make good, gaining his experience as he goes along, but the man who attempts to constitute himself a plumber without experience is pretty sure to come to grief. Should he eventually manage to pull through, however, his failures and inefficient work in the meantime will but cause his victims to heap opprobrium on the heads of the worthy members of the craft.

And how is this difficulty to be overcome? How is the botcher and the incompetent to be kept out of the ranks?

The answer is, by advertisement. Let all those who are willing to stand behind their work and who take a pride in their calling get together and make the public acquainted with the actual state of affairs. Let them give warning that there are, unfortunately, men who call themselves plumbers who are unworthy of that appellation, and that it is necessary for everyone requiring plumbing work to be done to be circumspect as to whom he employs, and that they themselves will, if anyone of them is employed, be responsible individually and collectively that the customer is fairly treated.

In any community, of course, there will be found a certain number of people who will grumble at anything, and the sanitary engineering trade is not likely to escape these discontented ones any more than other trades, but as a general rule people are willing to pay well for good work. So long as the sanitary engineer puts in good work he will find the public, as a rule, ready to pay him well for it; but what the public does object to, and rightly, is to be called on to pay as much as the best man would charge and then to find that the job has been botched and has to be done over again. The majority, and the big majority, of the public are reasonable and expect no man to work without a fair profit, but they are not willing to pay for material spoiled and needless expense incurred owing to the incompetence of those who profess to know the plumbing business but who in reality know nothing whatever about it.

In setting out to prove to the public that they are anxious to give a square deal, sanitary engineers admittedly have no easy task, but it is one from which the honest man will not flinch. Innuendoes of overcharging and other complaints will no doubt be unjustly made against him. These he must treat with every courtesy, explaining how they are not justified. Let him not, however, make the mistake of reducing any charge he has once made. Once he has decided what is a fair price, fair to himself and to the customer, to that price he must hold.

By making it known that he is ready and willing to give a square deal and by actually giving it, he will soon overcome the prejudices and handicaps under which he has labored in the past and so will be instrumental in placing his profession upon a higher plane and

(Continued on page 20.)

WINNIPEG PLUMBING DIVISION

Permits issued
102

Inspections

Water Tests	Smoke Tests	Subsequent Inspections	Miscellaneous Inspections	Defects Rectified
22	78	287	34	201

Sewer Division

Permits issued	Connections constructed	Inspections
6	4	52

Sewer Flushing

Tank Flushings	Hose Flushings	Total Gallons of Water
Gallons	Gallons	
637,440	489,375	1,126,815

The above table shows the work accomplis hed by the Winnipeg Plumbing and Sewer Inspection Department during the mont h of April—a public service that cannot but be of inestimable value to the citizens of Winnipeg.

Gas Industry and Canada's Fuel Problem

Dealing With the Great Strides That Have Been and Are Being Made in Manufacture and Furnishing of Gas for Both Home and Industrial Purposes—Its Uses Defined and Why it is More Economical to Many Industries When Every Phase of the Business is Taken Into Consideration

By Arthur Hewitt, General Manager, Consumers' Gas Company of Toronto*

THE condition which prevails in Canada to-day, with regard to the supply of fuel necessary for the maintenance of the industrial activity of the country, and for the domestic requirements of its population, demands a careful survey on the part of Governmental authorities, and that every possible economy be exercised in order that the total requirements of fuel may be reduced to a minimum.

The fuels available for use in Canada may be generally stated as coal, wood, petroleum, gas, and water power electrically distributed. Each of these fuels has certain inherent advantages and their economic value is largely determined by the service to which they may be applied, and the localities in which they may be required.

In considering the economic value of various fuels on which Canada may rely to meet its domestic and industrial requirements, manufactured gas, or what is sometimes called "City" gas, must be given an important place. Originally used only as an illuminant, gas has become one of the vital necessities of the domestic and industrial life of urban communities throughout the civilized world.

In using the term "City" gas, I mean gas as ordinarily manufactured by gas companies, and distributed through pipe line systems laid beneath highways of cities and towns. In the early days of the industry, this commodity was called "Coal" gas, for the reason that it was produced entirely from bituminous coal. The qualifying word "City" may be appropriately prefixed to the commodity as now supplied in recognition of the fact that economic considerations have caused different localities to combine with the coal gas what is known as carburetted water gas. Indeed, in many cities on this continent carburetted water gas now forms the whole of the supply.

For practical purposes, however, there has been very little difference in the general character and useful properties of city gas, during more than one hundred years.

The tremendous development and growth of the gas industry, particularly during the past ten years, furnishes abundant evidence of appreciation by the public of the merits of the commodity supplied, and of the economy in the use of gas for the thousand and one purposes for which it is now so well adapted.

Its success in holding the market against all rivals of the same order of utility is due, largely, to its possession of certain valuable and unique physical properties, viz:

(1) It is a permanent gas, suitable for consumption in or out of doors, either as an illuminant or as a smokeless fuel of high or low intensity, or as a source of motive power; all from the same supply system.

(2) It is susceptible of perfect subdivision without loss of efficiency for use in either required application for lighting or the production of heat or power. The cost to the consumer is always in direct proportion to the quantity consumed.

(3) It is a readily available fuel, cleanly and inoffensive, to be obtained by the turning of a tap, which will grill a chop, boil a kettle, or heat a flat iron, and there is no metallurgical or smith's work for which its heat is not adequate, no household warming for which it is not suitable.

City gas as supplied in Toronto is made by the distillation of Youghiogheny and Westmoreland coal, obtained in the Pittsburg district, with the addition of about 40 per cent. of carburetted water gas.

At this point it might be interesting to see what a gas company can secure from a ton of bituminous coal.

In the first place, a ton of gas coal in an efficient carbonizing plant will yield ten thousand cubic feet of gas, from which may be extracted a certain percentage of benzene and toluol. It will produce approximately 1,350 lbs. of coke, from which, after providing the necessary fuel for the producers, there will be left a residue of from 800—850 lbs. of coke to be marketed as fuel for steam raising, industrial purposes and for domestic use. It will yield ten Imperial gallons of tar, from which may be recovered toluol, benzene, fuel oil, acids, dyes, etc. Another important by-product is ammonia, useful in the manufacture of fertilizer, and for refrigeration and other purposes. There is also, as a minor by-product, retort carbon, which is used in the manufacture of carbon electrodes for searchlights, electrical steel furnaces, etc.

It is estimated that the percentage of efficiency obtained from coal in a gas works will run from 60 to 70 per cent. Compare this with the efficiency obtained in general practice from a ton of the same kind of coal used in an open fire which has just been fed with coal. Would the efficiency be 20 per cent. or less?

Let us make another comparison, and remember that the object of our discussion is to find the most economical way to use fuel, and especially coal.

The available supply of anthracite coal is admittedly limited, and the need for conservation is probably greater with regard to it than is the case with any other kind of fuel. From every thousand tons of bituminous coal which a gas company carbonizes it produces and makes available for general consumption, as a substitute for anthracite coal, four hundred tons of gas house coke. The value of coke, as compared with anthracite coal, may be observed from the following analysis:

	Anthracite Coal	Coke
Moisture (after air drying)	3.20	1.60
Volatile combustion	6.86	8.27
Fixed carbon	76.61	76.23
Ash	13.33	13.90
Sulphur	.9?	.94
Gross B.T.U. per lb.	12800	12200

Gas for Lighting

Under the conditions formerly prevailing when gas was sold exclusively for lighting by its luminous flame, the criterion of its value to the consumer was its illuminating power, but since the introduction of the Welsbach system of gas lighting by the heating to incandescence of a foreign substance in the Bunsen or non-luminous flame of gas mixed with air, gas is merely burned as a fuel just as for the purpose of cooking, and generation of motive power.

Gas for Cooking Purposes

Aside altogether from the cleanliness, ease of control, reliability of quantity and quality of supply, in which respects it stands pre-eminent, in point of economy there is no fuel which at prevailing prices can begin to compare with the cost of gas for certain kinds of service. If gas exclusively were used for cooking in the City of Toronto there would be a large money saving to the consumers, but more important than this saving would be the economic advantage gained by having to import so many tons less of anthracite coal.

Gas as Fuel for Industrial Purposes

A great deal has been said from time to time as to the insanitary conditions of the atmosphere in our city, caused by the discharge of black smoke from chimneys. In spite of by-laws, and the watchfulness of officials concerned with their enforcement, the evil seems to remain unabated, with every prospect of conditions becoming worse with the further growth of the city.

The problem of furnishing power, without making smoke, is rapidly being solved by the use of water power, dis-

*Read before the Canadian Society of Civil Engineers, at Toronto, March 27th, 1918.

tributed by electric lines. The use of coal in manufacturing processes, however, is still to be considered. Here the gas industry offers a means for the displacement of crude heating, which not only disestablishes the chimney as a polluter of the atmosphere, but introduces into the factory itself a controllable and uniform system of heating, producing constancy of result, and adding materially to industrial economy by the reduction of labor, the promotion of cleanliness and the speeding up and improvement of factory output. These aspects of the case require the main part of our consideration, but without going into details we might well consider also the great destruction of value for which the present crude methods of heating in factories are responsible. While gas can supply heat so easily controllable that there is comparatively little waste in obtaining from it effective duty, with coal there is necessarily a large waste of heat. There is a large amount of heat wasted in effecting its combustion, and in driving off those volatile constituents which are useless where high temperature and pure incandescence are required. There is also waste of heat up the chimney and through stand-by requirements. There is waste of heat every time a fire is re-charged until once more favorable working conditions of the fire are obtained. With the gas as fuel, the heat can be directed exactly as needed into the furnace, and heat losses by radiation and otherwise can be reduced to a minimum.

I do not say that coal can be entirely displaced in factories; but I claim that a large part of it could be. The point I wish to make is, that, in addition to air pollution, our industries are largely wasting, by their crude methods of heating, parts of the substance of the country which are necessary, more necessary to-day than they ever have been.

If these statements are correct, it can readily be seen how vast an opportunity there is to benefit the country at large, if we are able in any appreciable extent to do away with this waste. In case of any doubt as to the practicability of accomplishing this result, I believe that when it is seen how much has already been done, in developing gas appliances to supplant the crude methods still so largely used, our knowledge of possibilities will lead us to believe that we see only the dawn of a new era in industrial heating.

The manufacturer has his point of view in this matter. It is not sufficient to explain to him how the use of gas will benefit the community, it is necessary to show him that it is to his direct benefit as a manufacturer to adopt the modern methods of using heat in his processes. Some of these advantages are:

1. Economy in space occupied by appliance, and in some cases the necessity and expense of a smoke stack is avoided; a practically unlimited choice of a position for the furnace, which enables it to be brought into close proximity to the machine workers.

2. No space required for storage of fuel, and no removal of ashes.

3. Increase in output per cubic foot of factory space, owing to economy of space occupied by gas furnaces in comparison with coal furnaces.

4. The constant and unvarying supply of fuel, of a uniform heat value, at a fixed rate.

5. Labor saving—absence of stoking, storage and conveyance of fuel.

6. Rapidity, and improved production, due to ability to precisely control working temperatures.

7. In many cases a lower capital expenditure for installation.

8. Cleanliness, which frequently assists in decreasing net labor cost.

9. No interest to be paid on investment in fuel in storage.

10. Reduced fire risk.

11. No loss of material due to inability to check a high temperature instantaneously.

12. Less repairs on equipment.

13. Enormously smaller loss from articles or materials being spoiled by irregular heat.

When these points are taken into consideration, it is really astonishing how many instances there are where the total cost of manufacturing is less with gas than with coal.

The following list contains but a few of the hundreds of successful gas appliances available, and in use, and while the consideration we can give to each will be necessarily brief, it will give a fair idea of the accomplishments in this field.

Baking Ovens.—The use of gas for baking bread and pastry in small bakeries, restaurants and institutions has proven very satisfactory. With large bakeries, however, although some progress has been made, there is yet much more business to be secured for gas.

Japanning Ovens are of two general types—the direct heated, and the indirect heated. In the direct heated, the fuel is allowed to burn in the japanning compartment; in the indirect heated, the fuel is burned independently of the japanning compartment, the products of combustion being carried up through radiators placed at the sides of the oven, and then carried out through suitable flues. Gas is superior to steam for heating japanning ovens, where temperatures from 150° F. upward are required. Gas is superior to coal on account of its cleanliness, time consumed in getting oven ready for baking, dust and dirt incidental to the use of coal, and for many other reasons. With the use of gas, temperatures can be exactly regulated according to requirements, while a coal fire is not capable of being so regulated.

Heating Liquids

Glue Heaters—The heating of glue is one of few processes where the difficulty is not that of getting enough heat, but of getting too much. Glue should not be heated over 150° F. If it is heated to the boiling point of water it is practically ruined. It is hardly necessary to say that the ease with which an exact temperature is maintained by the use of gas puts this fuel in the first place as a means of heating glue. The appliances are quite simple—just one or more pots of suitable size, suspended in water, the water being kept hot by means of a small burner. There is also a contrivance supplied with a mechanical agitator, which is useful in assisting to dissolve the glue.

Cauldron Furnaces.—These are constructed either round or rectangular in shape, and are generally direct-fired, in which case the gas burner is placed immediately below the cooking cauldron. Sometimes, where the materials to be heated will burn easily, a water compartment is interposed the same as with glue heaters.

Cauldron furnaces are made in sizes ranging from five gallons up to 150 gallons, and sometimes even larger. They are extensively used, and with almost universal satisfaction. Some of the uses to which they have been adapted are as follows:

Rendering lard, scalding chickens, heating potash, making disinfectants, making face creams, cooking meats, making marmalade, jellies, etc., canning fruits and preserves, boiling syrups, metal polishes, wax melting, grading oils, making pastes, making soap, heating water, dyeing, cooking potato chips, making soups, making soft drinks, etc., making catsup, pickling vegetables.

Bakers' Fryer—This is practically the same as a cauldron furnace, except that some manufacturers supply simply a burner and frame without the cauldron, thus allowing the customer to use the same utensil which was formerly used on the coal-heated stove. It is used for frying crullers, potato chips, etc.

Confectioners' Furnace.—The success of the process of boiling candy is mostly one of securing the right temperature. A certain amount of moisture must be driven off from the original mixture of sugar, water and other ingredients before the proper temperature can be reached. The gas consumption varies from 1½ to 3 cubic feet per pound of candy, according to the temperature required.

The gas confectioners' furnace has many advantages over furnaces using coal or coke. Cleanliness is one of the most important items in a place where candy is being made. Of course there is absolutely no dirt from the fire when gas is used. The furnace is always ready for immediate use. It makes the keeping of the factory cool, in summer, much easier. If a proper gas furnace is used, a great deal more work can be turned out than with the best coal furnace. The heat can be regulated at the will of the operator, which cannot be done so readily with coal.

TENDERS FOR PARLIAMENT BUILDINGS

Anouncement is made by the Department of Public Works of the letting of a number of contracts in connection with the construction of the new Parliament Buildings. E. W. Edge, Ltd., Ottawa, have successfully tendered for the heating and ventilating equipment for the new building at $386,000. This was the lowest tender. Other tenders all exceeded $400,000, the highest being $469,000.

Public Health Neglect Economic Loss

Plumbing and Sanitary Engineering, as Well as Heating, Have a Great Bearing Upon the Health of the People—Plumbing By-laws Should be Guarded and Heating By-laws Put Into Force by Practical Men

IN the last issue of SANITARY ENGINEER there appeared an article entitled "Guard the Plumbing By-laws." Many proofs were given that jerry and speculative builders were trying to have plumbing by-laws repealed, etc., and part of a report from the American Public Health Association also showed that unpractical men were trying to have unpractical plumbing by-laws put into operation. And the strangest part about some of these proofs is that medical men, men well educated, men who know, or appear to know that 95 per cent. of the ills which the human animal man seems to be heir to, are preventable. For example, the following is an extract from an article by Dr. Chas. J .Hastings, M. O. H., Toronto, a man who in his daily actions would relegate the city plumbing department to the scrap heap, or even worse, place it under the jurisdiction of the architect or building department. Dr. Hastings says in his article that "On this continent exponents of preventive medicine have recognized the writing on the wall and are looking and hoping for a national organization of health, in order that we may efficiently accomplish in the future that which we have in a sense only been touching the fringe of in the past. But this cannot be accomplished without the large expenditure of money and, in order to obtain this money we must be in a position to show that the expenditure is warranted."

The late W. E. Gladstone once said: "In the health of the people lies the strength of the nation."

It is a recognized fact that on the efficient solution of the problems of public health depend the comfort and prosperity of our peoples and the future greatness of our nations. But, unfortunately, our civilization has not sufficiently advanced for us to appeal for this on humane grounds alone, therefore we have to present the economic side of the problem in cold figures of dollars and cents. For this purpose probably the most valuable and most reliable records we have are contained in the report of the Committee of One Hundred on National Health, dealing with the national vitality and setting forth its waste and conservation.

From this report we learn that the annual loss from preventable deaths has been conservatively estimated at $1,100,000,000. If to this we add the loss of time and money from preventable illness which is estimated at $550,000,000, we have a total of $1,650,000,000 as the annual monetary loss to Canada and the United States alone, and these figures are considered by practical and very reliable authorities as extremely conservative.

Of the 690,000 who die annually in Canada and the United States from preventable diseases, a fitting epitaph for a large percentage would be "Poisoned by sewage-polluted water"; for a still larger percentage "poisoned by milk," and for a still larger number, "Victims of white plague."

Of the $1,650,000,000 loss to these nations, over $250,000,000 are spent on medical attendance and medicine in endeavoring to cure diseases that should never have occurred. The United States and Canada squander $200,000,000 annually on patent medicines, and less than $5,000,000 on public health.

I venture to say, without fear of contradiction, that if the amount of money spent in the attempt to cure diseases that should never have occurred, plus the amount spent annually on patent medicines, was spent in the organization and administration of a national army of health, in less than one decade preventable diseases would be prevented."

Does it not seem strange that in spite of the doctor's convincing arguments for the benefit of public health, etc., that he should have such pronounced views regarding plumbing?

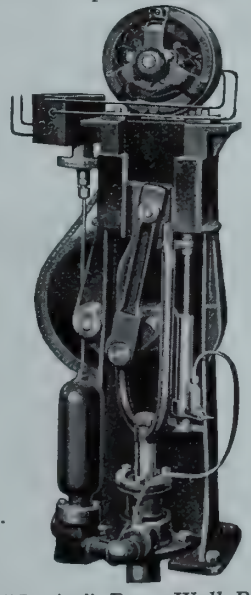
The Remedy

What SANITARY ENGINEER advocates is that a medical health office should comprise two departments, one medical and another mechanical, and had we adhered to that opinion, we know we will win out. We know there are towns and cities on this continent that are already adopting such an arrangement and we believe it is the right thing to do. Medical men will always be required, but we do feel that sanitary engineering is a matter of health and we do persist in taking the stand that jerry builders and building speculators, careless and unpractical architects should keep clear of the plumbing by-laws.

New Sanitary and Heating Goods

A NEW DEEP WELL PUMPING UNIT

The Dayton Pump & Manufacturing Co., of Dayton, Ohio, informs us that they have gotten out a new and novel type of deep well pump which will be known as their Number 40 "Junior." It is automatic in operation and is, we are



40 *"Junior" Deep Well Pump*

told, silent in operation, the motor is a silent chain drive unit, which requires in that case no belts or idler. It is fitted throughout with Hyatt roller bearings and is built in several sizes that will furnish from 124 to 212 gallons per hour, Several methods of installing same are shown in their new bulletin Number 42, which may be procured by dropping a post card to above address.

NEW HEATING SPECIALTIES

The N. E. Frost Company, 231 Insurance Exchange, Chicago, are issuing a neat little brochure entitled "Heating Specialties." It contains some very interesting information of value to every heating engineer. Some of the lines described therein are novel and different from many other specialties now on the market. A post card sent to the above address will procure one of these booklets.

NEW BOOKLET

Newport Heating is the title of a well gotten up brochure being issued to the trade by the Lord & Burnham Co., of Canada, Royal Bank Buildings, Toronto.

It describes very fully some of the special outstanding features that are claimed for the Newport Magazine Feed Boiler. It is well illustrated and contains some good information on magazine feed boilers. Any reader may procure one of the books by dropping a post card to the above address.

Toronto Society Regular Monthly Meeting

The Question of Co-operative Advertising Was Discussed—There Was a Good Attendance—Some Splendid Suggestions Were Given

THE regular monthly meeting of the Toronto Society of Domestic Sanitary and Heating Engineers was held in the Canadian Foresters' Hall, 22 College Street, Toronto on Wednesday, April 17, and a good number were in attendance.

One of the most interesting subjects of the evening was introduced by Roy E. Belyea, Toronto, on co-operative advertising. Mr. Belyea referred to the slanderous statements made by a member of the Toronto Board of Education, when the latter charged the Toronto craft as a whole with being a lot of plundering plumbers. Mr. Belyea was of opinion that a definite stand should be taken by the whole trade to obliterate the false impression which the public had of plumbers as a whole. He took exception to being classed as a plundering plumber and went on to say that in spite of the impression which the public appeared to have, his concern was very seldom charged with incompetency, or had much trouble in collecting their accounts; when they had, the firm generally investigated any complaints and arranged matters to the satisfaction of the customer. He cited a case which was only one of many where a customer had called on them to send a man to fix a tap, a few days later when the bill was presented the customer stated that the tap was leaking as badly as ever, and upon looking at the tap this was found to be the case, but after making the tap O.K. and taking the matter up with the first man who had fixed a tap, it was found that the customer had wilfully told a falsehood and that the second tap fixed was not the same as the first, so that actually two taps were repaired and only one was paid for.

Mr. Belyea closed his address by suggesting that a certain amount of regular advertising space be used in one of the Toronto papers, and each member of the society, or as many as felt they could, should pay their share of the cost, the more the better and bigger space could be used.

Mr. Edwin Newsome, editor of SANITARY ENGINEER, then addressed the meeting and read extracts from an article that appeared in SANITARY ENGINEER. He explained that SANITARY ENGINEER was conducting a private investigation among members of the public asking them to give particulars of their dealings with sanitary engineers, etc.

Quite a number of persons had been interviewed with interesting results. In some cases persons who aired their grievances in the most forcible manner referred to incidents which they recalled of long ago. Others declared that when a bill appeared on the face of it to be exorbitant and they, the customers, had absolutely refused to pay it, that the sanitary engineer had never even taken the trouble to collect the account or make a compromise.

Such conduct on the part of the trade was taken as an admission that the account was not a fair one.

There was another case where one person frankly asserted that "he never paid a plumber's bill without a kick and was always able to get a big reduction. Therefore," said he, "it pays to knock the plumber," etc.

Mr. Newsome also referred to a suggestion as to co-operative advertising which should be paid for collectively by the trade. The course suggested was that a certain amount of space should be contracted for in the paper considered the most suitable, and that the advertisement should comprise a statement to the public that those firms mentioned were out to guarantee their work and material, etc.; then this statement should be followed by a list of sanitary engineers and their addresses in full. Then below an explanation that a committee of members of the trade from the list would be only too pleased to investigate any complaints made or any dispute in connection with work done or charges made for same, also that a private individual, not interested in the transaction, could be asked to act on this committee.

Mr. Newsome was then asked to procure rates from the paper he thought would be the best suited to the purpose, and when all particulars were procured a regular plan could be further discussed at the next regular meeting, which will be duly announced in SANITARY ENGINEER.

The discussions closed and the majority present endorsed the opinion that some means should be adopted to secure the public's goodwill.

HOW TO SECURE PUBLIC GOODWILL

(Continued from page 16.)

causing it to be respected rather than contemned.

One point more cannot be too strongly impressed upon all sanitary engineers and that is the necessity of explaining to the public the why and wherefore of their charges. The average man is reasonable and open to conviction. If, for instance, high quality goods are installed, explain to him the difference in value, why it is cheaper in the long run to have them. Make up your mind honestly to satisfy him that your charges are reasonable. It is far better to do this than to knock something off the bill for the sake of satisfying him. The latter course gives him no real satisfaction, he is only all the more convinced that you were trying to overcharge him and on the next occasion he will again grumble with a view to getting the bill reduced.

Let him see, on the other hand that you stand by your charges and are prepared to prove them just and fair, and you will gain his respect; he will come to regard you as a fair-dealing, honest tradesman, and the proverbial reputation of the plumber will become a thing of the past.

An official photograph of the club with which the German armies "finish off" wounded soldiers. 32,000 of these were recently captured by the Italians.



THE DESTRUCTION OF CIVILIZATION

is in grim and sober reality what we are fighting this war to prevent. The club pictured above — from an actual official photograph—might be the weapon of a savage cave man of five thousand years ago. It is in fact the weapon with which German soldiers "finish off" enemy wounded who have fallen on the battlefield.

There is only one answer to make to such methods — the defeat of the German armies. America has taken up the sword to give that answer. Our army is in France to help win this war on the battlefield—that civilization may be safe, that America may be safe.

Extracts from an advertisement appearing in a number of U.S. trade journals, in aid of the sale of Liberty Bonds

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EDWIN NEWSOME - - - - - - - Editor

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THE PUBLIC WELFARE ESSENTIAL

IF representatives of the public and of the press could have been present at the recent meeting of the Toronto Society of Domestic Sanitary and Heating Engineers and if the public could have been made cognizant of the nature of the feeling toward them which pervaded the meeting, there would be no necessity to study the question as to why public feeling is hostile to the craft and we should have no occasion to complain of the abuse heaped upon the trade by an unthinking press whenever an opportunity occurs.

Sanitary engineers in Toronto in spite of the fact that they are abused from the rising of the sun to the setting down of the same, feel that the public is mostly right. They feel that, if the public only knew and would at least listen to reason and prevent every tinker on the earth from practising at the trade, the practical man would be able to get along much better; that plumbing would be better and more efficiently installed and would not require to be repaired as often as is the case to-day.

Several members of the trade referred to cases where hardwaremen sold cheap lines over the counter and people tinkered with work, then when it was a failure they called in another tinker who made it worse if it was possible to do so.

Of course it was felt that with the good work at the technical school and the examination which those engaged in the business had now to pass before procuring a license, that a lot of good would result. It is no doubt a matter of education on the part of the public and once the public can be shown that the trade really desire to give and be given a square deal a better feeling will prevail. One thing certainly will have to take place and that is that the public must become more conversant with values. For example, one firm may tender a price and another may be possibly only 1 or 2 per cent. higher, but the lowest bidder gets the job, when as a matter of fact only the highest priced jobs are good value at all. Low priced plumbing and heating installations without doubt are a constant source of expense. As a result there is far too much repair work that should never have to be done, and such a condition can only be overcome by the public becoming more conversant with true values. Such expressions resulted in the advocation of co-operative advertising. More of this subject will be taken up in the next issue of SANITARY ENGINEER.

HOW TO REDUCE FIRE LOSSES

IF we are to have a happy and contented farming community in Canada, it is the city men who will have to pay more attention to the requirements of the farmer. If fire losses in country towns are to be reduced, water under pressure will do much to reduce these losses, and water under pressure means two things. It either involves the whole town with the cost of a more or less elaborate public water supply system, with fire hydrants, etc., all of which water system must be protected from frost at a big cost of upkeep. Or it means that every householder, etc., shall be required to instal a pneumatic pressure system, and why not? Should the country have to suffer fire losses at the rate it is doing because a farmer would rather buy all manner of reapers and binders, etc., and other farm implements, many of which are left in the fields all the winter to deteriorate, and make his house a fire trap for lack of a water system?

Water and warmth are the first most important requirements of humanity, with food and clothing next, and water to do all that it can do for the occupants of a home should be under pressure and on tap in the house 24 hours a day.

Very few fires have occurred that could not, in their early stage, have been put out with a stream of water from a pneumatic water system, and what can they be procured for in dollars and cents cost?

Oftener than not, at less than 10 to 12 per cent. of the amount paid for a house building. Then again there can no doubt be a reduction in the fire insurance rates if a pneumatic water system is installed.

Many persons fail to realize that even though a house is insured, the loss of it by fire is an economic loss to the country. It is a wicked waste of the country's resources and should not be tolerated any longer than possible. For a number of years fire losses have steadily increased, which means that there has been a steady increase in needless waste. As is shown in an article on page 13 in this issue, as recently as the year 1914, Canada's fire loss in buildings that year alone amounted to twenty-one million dollars, while the total value of buildings erected amounted to ninety-one million dollars. Surely such figures would furnish good food for thought, and prove convincing to every householder, or farmer in a rural district.

New Canadian Patents

No. 181,748.

Gert O. Tilden, Trenton, New Jersey, U.S.A., 22nd January, 1918; 6 years. Filed 12th November 1917. Receipt No. 287,506.

Claim.—1. A closet seat and cover hinge comprising a post having a socket, a threaded pintle having a head pivoting in said socket, a hinge member adapted to overlap a closet seat and cover having a perforation to receive said pintle and having a socket, and a pin rigid in the cover and pivoting in the socket of the said members.

2. In closet seat and cover hinges, a pair of brackets overlapping the lateral edges of a closet seat and cover, means for pivotally connecting said brackets to the cover, means for rigidly connecting said brackets to the seat, and a pair of posts supported by a closet bowl for pivotally supporting said seat and cover upon the bowl.

3. A closet seat and cover hinge comprising a bracket having a socket near one end and a perforation near the opposite end, a pin rotatable in said socket, a pintle inserted partway through said bracket having a cylindrical head, and a post having a socket to pivotally receive said head.

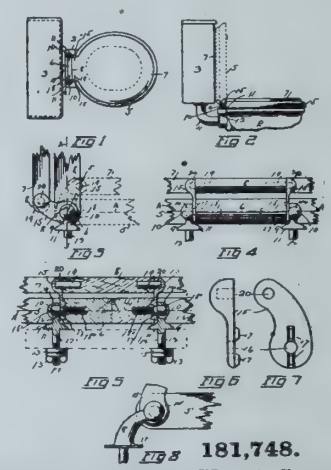
4. A closet seat and cover hinge comprising brackets overlapping the lateral edges of a closet seat and cover having sockets facing said cover and having perforations spaced from said sockets, pintles carried by the seat passing through and holding said brackets rigidly against the seat, and pins carried by the cover pivotally engaging the sockets in said brackets.

5. In a closed seat and cover hinge, the combination with the seat and cover, of brackets engaging the lateral edges of said seat and cover, means for pivotally connecting said cover between said brackets, a pair of posts, and pintles screwed into the opposite lateral edges of said seat having heads pivotally engaging said posts and holding said brackets rigidly against the lateral edges of said seat.

6. The combination with a closet seat and cover, of a pair of hinge members overlapping the opposite lateral edges of said seat and said cover, said members having sockets facing said cover and having perforations registering with the lateral edges of said seat, pins carried by the cover pivoting in the sockets of said members, pintles passing through the perforations of said members and screwed into said seat for holding said members rigidly against the lateral edges of the seat, and posts having sockets to receive the heads of said pintles.

7. The combination with a closet bowl and a movable seat and cover, of a "close roughing in" hinge mechanism, comprising a pair of hinge posts supported by said bowl, said posts spaced apart to receive a reduced portion of said seat and having sockets facing said seat, brackets engaging both the seat and cover having sockets facing the cover and having perforations registering with the sockets in said posts, pins supported by said cover and engaging the sockets of said brackets, and pintles screwed into the opposite lateral edges of said seat having heads engaging the sockets of said posts and clamping said brackets to the opposite lateral edges of said seat.

8. The combination with the seat and cover, each having corresponding reduced end portions, of a "close roughing in" hinge mechanism, comprising posts spaced apart to receive the reduced end portions of said seat there between, brackets disposed between said posts and said seat and engaging the lateral edges of the reduced portions of said seat and



181,748.

Hinge for Water Closet Covers.

cover, pintles passing through said brackets and into said seat for holding said brackets rigidly to and movable with said seat, said pintles having projecting heads engaging sockets in said posts, and means for pivotally connecting the opposite lateral edges of said cover to said brackets.

9. A closet seat and cover hinge comprising hinge members overlapping the lateral edges of the seat and cover, said members rigidly secured to the seat and pivotally secured to the cover, posts for pivotally securing the seat and cover to the closet bowl, said posts having sockets facing the opposite lateral edges of the seat and being in the line of the vertical axis of said posts, pintles driven through said hinge members and into the lateral edges of said seat in the line of the longitudinal axis of said seat, and having projecting heads which pivot in the said sockets adapted to support the rear portion of the seat and to allow said seat to be rotated from the horizontal to the vertical position for bringing said horizontal axis in line with the vertical axis of said posts, the said hinge members adapted to support said cover when the seat and cover are standing upright in position to exert a leverage for preventing the seat from falling.

10. In a water closet, a seat and cover hinge comprising hinge plates overlapping the rear lateral edges of the seat and cover having perforations in line with the longitudinal axis of the seat and having sockets in line with the longitudinal axis of the cover, pins rigid in the cover and rotatable in said sockets, posts having sockets facing the edges of said seat and pintle bolts passing through the hinge plates and screwed into the seat having projecting heads to engage the sockets of said posts.

11. In a water closet, a seat and cover hinge comprising hinge plates overlapping the rear lateral edges of the seat and cover, pins rigid in the cover and pivoting in sockets in said plates, vertical posts having sockets facing the edges of the seat, pintles passing through said plates and anchored in said seat in the line of the longitudinal axis of the seat and having projecting heads rotatably received by the sockets of said posts, and means for utilizing the weight of the cover for preventing the seat from falling from the upright to the horizontal position.

12. In a water closet, a seat and cover hinge comprising a pair of spaced posts having sockets facing the lateral edges of the seat, hinge plates overlapping the rear lateral edges of the seat and cover and rigid with said seat, said plates inclining forwardly of the vertical axis of said posts when the seat and cover are in the horizontal position and adapted to incline rearwardly of said axis when the seat and cover are in the upright position whereby the weight of the cover overbalances the weight of the seat and prevents the seat from falling, means for pivotally connecting the cover to said plates, and means for pivotally connecting the seat to said posts.

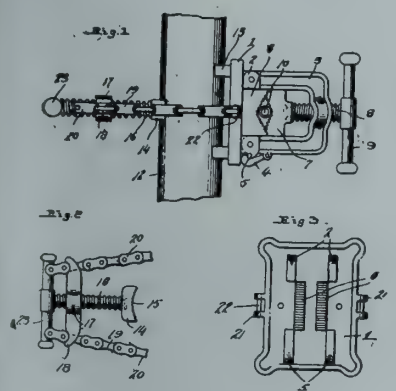
No. 181,488.

John A. Depoint and Ernest C. Van Hec, co-inventors, both of Sodus, New York, U.S.A., 8th January, 1918; 6 years. Filed 19th March, 1917. Receipt No. 277,207.

Claim.—1. A device of the character described including a vise carrying base,

po engaging jaws integral with the
h chains connected to the sides of the
a chain engaging member having
respective ends slotted for receiving the links of the chains, a screw bar adjustably mounted in the chain engaging member, a post engaging jaw forming a bearing for the screw bar, and a handle rigid with the screw bar for consequently holding the base in position.

2. A post pipe vice including a base, post engaging jaws integral with the



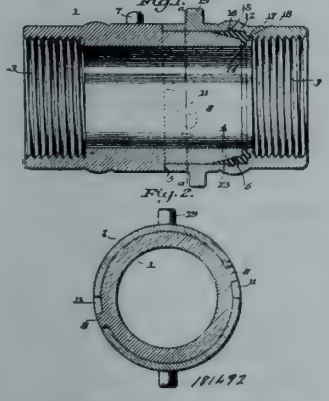
No. 181,488. Pipe Vise.

base, chains connected to the opposite sides of the base, a movable post engaging jaw, and means swivally connected to the movable jaw and connected with said chains for tightening the latter to hold the base in position.

3. A device of the character described including a vice carrying base, post engaging jaws integral with the opposite face of the base, chains connected to the respective sides of the base, a movable post engaging jaw to co-act with the rigid jaws, a screw rotatably connected with the post engaging jaw, and means mounted on said bar for receiving the chains whereby the movable jaw may be pressed into engagement with the post the base held in position.

Robert Bennett, Beacon, New York, U.S.A., 8th January, 1918; 6 years. Filed 25th April, 1917. Receipt No. 278,958.

Claim.—In a hose coupling the combination of a member having a tapered



181,492. Hose Coupling.

projecting end and also provided with radial studs, and a second member having a counter bore to receive the tapered end of the first-named member and also having a quadrant-shaped locking slot to receive the studs of the first-named member, and a gasket in the base of the counterbore of the second-named member for engagement and compression by the tapered member of the first-named member, the said gasket having an annular rib on its outer side and its base, and the second member having a plurality of grooves engaged by the respective rib on the outer side of the gasket and the rib on the base of the gasket, said rib and grooves co-acting with each other to prevent detachment of the gasket.

No. 181,923.

The Bryant Heater and Manufacturing Company, Cleveland, assignee of Otto Fox, Lakewood, both in the U.S.A., 29th January, 1918; 6 years. Filed 7th December, 1917. Receipt No. 288,436.

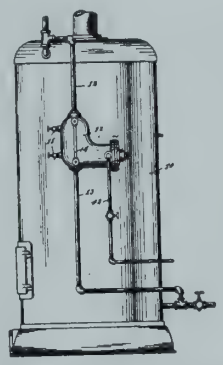
Claim.—1. In a feed water control for boilers, a float chamber including a removable plate, a float in the chamber, a valve supporting member carried by said plate, a valve supported for endwise movement by said member, a valve seat carried by said plate and extending through the same to the exterior thereof whereby the seat may be adjusted relative to the valve, means operatively connecting the float to the valve so that the valve will be opened when the water reaches a predetermined low level in the chamber and will be closed when the water reaches a predetermined high level therein, and means separate from the outer end of the valve seat for supplying water to the chamber through the valve.

2. In a feed water control for boilers, a float chamber, a float therein, a valve supporting member carried by the chamber, a valve supported by said member, a valve seat for said valve extending to the exterior of said chamber whereby the seat may be adjusted relative to the valve, means operatively connecting the float to the valve so that the valve will be opened when the water reaches a predetermined low level and will b closed when the water reaches a predetermined high level in the chamber, said chamber comprising a body portion and a removable plate, the latter supporting said valve supporting member, the valve, the valve seat and the float, said valve seat having an opening for the passage of water, and passageways for supplying water to said opening and comprising a passageway in the plate and a passageway in the body portion of the chamber registering with said passageway in the plate.

3. In a feed water control for boilers, a float chamber, a valve supporting member supported by the chamber, a needle valve supported for endwise movement by said member, a valve seat for said valve extending to the exterior of the chamber whereby it may be adjusted relative to the valve, means connecting the float to the needle valve so that the valve wil be opened when the water in the chamber reaches a predetermined low level and will be closed when the watr reaches a predetermined high level, the chamber comprising a body portion and a removable plate carrying the valve supporting member, the valve, the seat and the float, and passageways extending through portions of said plate and of said body portion of the chamber for supplying water through the valve to the chamber.

4. In a feed water control for boilers, a float chamber, comprising a body portion and a detachable plate secured thereto, an inlet valve and valve seat, an outlet valve and valve seat, said valves being arranged side by side, a pair of floats for controlling said valves, said valves, vale seats and floats being carried by said detachable plate.

5. In a feed water control for boilers, a float chamber, comprising a body portion and a detachable plate secured thereto, an inlet valve and valve seat, an outlet valve and valve seat, said valves being arranged side by side, a pair of floats for controlling said valves, said



181,923. Feed Water Control Mechanism.

valves, valve seats and floats being carried by said detachable plate, said body portion of the casing having means for attachment thereto of a feed water pipe and an overflow pipe.

REAL SALESMANSHIP

The commonly accepted definition of the word "salesmanship" is: "The power to persuade people to purchase your product at a profit."

But that is not enough. When you have only "persuaded" a person to purchase you may have done so partly against his better judgment. Real salesmanship is to convince a person that he should buy your goods and to show how he can really benefit by so doing. Show him all the benefits if he buys, and what he stands to lose if he does not buy.—E.N.

Market Conditions and Tendencies

Statements Regarding the Prices and Trend of Supplies.

THE MARKETS AT A GLANCE.

THE situation in respect to tin is becoming increasingly difficult, and an advance in price of 10c per pound has been registered since last issue. Stocks are reaching a very low point, and in an endeavor to equalize distribution as well as possible, dealers are limiting orders to a one-ton basis. A further increase in the price of solder has been made in some quarters, and it has been intimated that unless further supplies of tin reach the market at an early date, manufacturing of many lines containing this metal must cease.

Shipments of heavy gauge black sheets are reaching the local market in very fair quantities, and the demand is good. The lighter gauges are not moving as well at present. A decline of 25c per 100 pounds has been recorded in some quarters. Stocks of both black and galvanized sheets are in very fair shape at present, with the latter holding firm and unchanged.

A car of boiler tubes has been received, but distribution is under Government supervision. Inability to get sufficient supplies of raw material is limiting production of wrought iron pipe, though production is taking care of present demands.

An advance of 10 per cent. in prices of enamelware in the United States has had a firming tendency on this line here, though no change has been made as yet, and none anticipated for some little time. Business is still being conducted within rather narrow limits in the majority of plumbing supplies.

TORONTO, April 27.—There have been numerous price changes during the period since last issue and advances have been general, although a further decline in black steel sheets is recorded. A decline in oakum has also been provided for in new prices issued. Wool waste and white wipers are higher and the continued strength of the market is shown in an advance of 10c per pound. This has also resulted in an advance in some quarters in the price of solder. Other metals are weak in tone. Business in some lines is brisk, but generally speaking trade is being conducted within narrow limits.

Range Boilers Firm; Large Sizes Scarce

RANGE BOILERS.—The situation remains firm and unchanged during the past couple of weeks. Supplies of the larger sizes show no improvement and shipments of the heavy sheets due for some time past are being held up. Business remains on a comparatively small scale.

	Standard	Extra Heavy
30-gallon range boilers	$14.00	$17.00
35-gallon	17.00	20.50
40-gallon	20.50	24.00
52-gallon	28.00	32.00
66-gallon	37.00	42.00
82-gallon	45.00	50.00
100-gallon	62.00	70.00

Very Firm Situation In Enamelware

ENAMELWARE.—An advance of about 10 per cent. has been put into effect by manufacturers in the United States, and this has strengthened the market here considerably though no change in price has been made as yet and none anticipated for some little time. However, there is little possibility of a decline materializing and this line should be a good buy now. There is no improvement in amount of business being handled.

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Sinks, roll rim, 18 x 30 in., staple	16 80
Closets, oak tank and seat	22 00
Do., enamel iron or white vitro tank	23 75

Soil Pipe Situation Remains Unchanged

SOIL PIPE, FITTINGS.—The market remains on the same basis as for some time past, without change. There is little activity in either soil pipe or fittings, business being on a very small scale. Cast iron and malleable pipe fittings continue to move in fair quantities, but the demand is by no means heavy. Discounts remain as follows:

SOIL PIPE FITTINGS.

Medium and extra heavy soil pipe, 6-inch and under	35%	2½%
8-inch soil pipe	....	30%
Medium and extra heavy fittings, and under	40%	2½%

C. I. PIPE FITTINGS.

Cast iron fittings	....	15%
Cast elbows, tees, etc.	....	15%
Plugs	25%	
Bushings	30%	33%
Flange unions, standard	....	20%
Dart unions, ¼-inch to 2-inch	20%	25%
Do., 4½ in. and larger	....	15%
Nipples, up to 4-inch	....	45%
Do., 4½-inch and larger	....	40%
Do., running thread 4-in. and under	....	25%
Couplings, 4-in. and under	....	35%
Do., 4½ in. and larger	....	15%

MALLEABLE FITTINGS.

	Black	Galv.
Malleable Fittings, Class A, lb.	0 50	0 63
Do., Class B, lb. net	0 22	0 33
Do., Class C, lb. net	0 15	0 22

Oakum Registers Decline; Waste Makes Advance

WASTE, OAKUM.—The position of oakum has eased considerably and indications are that the manufacturing end is in a much better position with respect to taking care of new business. The heavy rush of orders which has kept manufacturers and distributors busy for some time past shows signs of letting up somewhat and manufacturers are now accepting orders with an immediate shipping date. Quotations now being made are: American best, $21.00; clipper, spun, $21.00; clipper unspun, $19.50; plumbers', $8.00 per 100 pounds. English oakum is practically off the market owing to difficulty in procuring and there is no U. S. Navy being handled.

An advance averaging about ½c per pound has been recorded in some lines of waste during the week. Wool waste has all advanced and wipers, white quality, is about 1c per pound up. Prices established are now on the following basis: 1X, 17c pound; 2X, 18c; 3X, 20c; XC, 16c; polishing, 21c; colored wiping, No. 1, 14c per pound; No. 1A, 11½c; No. 1B, 10½c; No. 5, 15c; No. 7, 13c. The demand continues good and supplies ample for requirements.

		Per 100 lbs.
Best American	....	$21 50
Clipper, spun	....	21 00
Do., unspun	....	19 50
Plumbers', spun	8 00	10 00

Valves In Fair Demand; Firm And Unchanged

VALVES.—There is nothing new to report in respect to valves. A fair demand exists, and prices remain firm and

unchanged at discounts named herewith:

	Discount off list
Ground work	50
Compression work, standard	52
High grade	45
Cushion work	46
Fuller work, standard	50
High grade	43
Basin cocks, No. 0 standard	46
Nos. 1 and 2	46
Bath cocks	53
Flatway stop and waste cocks, standard.	53
High grade	50
Roundway stop and waste cocks, standard	53
High grade	50
Brass steam cocks, standard	Net
Globe, angle and check valves, standard.	10
Do., removable seat	7½
Radiator valves, standard	15
Do., removable seat	10
Patent quick opening valves	35
Basin Cocks—	
No. 0 and 1, Fuller pattern	50
No. 0 and 1, compression	46
Midget	50
Globe, angle and check valves, medium pressure	30
Radiator valves, standard	30
Radiator valves, Jenkins disc	30
Radiator valves, quick opening	40

Firm Situation Exists In Wrot. Iron Pipe

WROUGHT IRON PIPE.—A steady, firm situation continues to prevail in respect to wrought iron pipe. Difficulty in getting deliveries of raw materials is manifest and there is no surplus on hand. The demand is keeping up nicely and quite in line with the present limited production. Prices remain firm and unchanged as shown in panel herewith.

Boiler Tubes Reach City; More Coming

BOILER TUBES.—A car of boiler tubes has reached the city, but the distribution may be said to be under Government supervision. It is expected that further shipments will continue to come along in very fair quantities. Quotations as yet show no change and are as follows:

Toronto—	Per 100 feet Cold drawn	Lapweld
1 inch	$36 00	$ ....
1¼ inch	40 00	....
1½ inch	43 00	36 00
1¾ inch	43 00	36 00
2 inch	50 00	36 00
2¼ inch	53 00	38 50
2½ inch	55 00	42 00
3 inch	64 00	50 00
3¼ inch	....	58 00
3½ inch	77 00	60 00
4 inch	90 00	75 00

Black Sheets Register Decline Of 25c

SHEETS, PLATES.—A decline of 25c per 100 pounds in black sheets has been recorded in some quarters, this serving to narrow the range somewhat. A good demand for heavy gauge black sheets and plates is manifest and orders are going forward in good volume. Supplies are reaching the market in very good quantities though the lighter gauges in both black and galvanized do not appear to be rolling as freely as a couple of weeks ago. Stocks, however, are in very fair shape and orders are being taken care of promptly. No change in galvanized sheets has occurred since last issue. Prices now ruling on black and galvanized sheets follow.

BLACK SHEETS—	Per 100 lbs.
10 gauge	$....-$9 50
12 gauge	7 55- 9 60
14 gauge	7 45- 8 15
16 gauge	7 50- 8 25
18-20 gauge	7 30- 7 80
22-24 gauge	7 35- 7 85
26 gauge	7 40- 7 90
28 gauge	7 50- 8 00
3-16-inch plate	....- 9 10
¼-inch boiler plate	....- 9 00

WROUGHT IRON PIPE

Effective Feb. 26, 1918

Standard Buttweld—	Per 100 feet Black	Galvanized
⅛ in.	$ 6 00	$ 8 00
¼ in.	5 16	7 29
⅜ in.	5 16	7 29
½ in.	6 55	8 12
¾ in.	8 28	10 41
1 in.	12 24	15 39
1¼ in.	16 56	20 82
1½ in.	19 80	24 89
2 in.	26 64	33 49
2½ in.	42 71	53 53
3 in.	55 85	70 00
3½ in.	70 84	87 76
4 in.	83 93	104 10
Standard Lapweld—		
2 in.	29 60	36 08
2½ in.	44 46	54 70
3 in.	58 14	71 53
3½ in.	72 68	90 62
4 in.	86 11	107 37
4½ in.	97 79	122 56
5 in.	114 00	142 82
6 in.	147 80	185 28
7 in.	192 80	241 57
8 L in.	202 50	253 75
8 in.	233 30	292 32
9 in.	279 50	350 18
10 L in.	259 20	324 80
10 in.	333 70	418 18

Terms 2% 30 days, approved credit.
Prices—Ontario, Quebec and Maritime Provinces.

GALVANIZED SHEETS—			
10¾ oz.	$ 9 00	$9 25	$10 50
U.S. 28	8 70	8 95	10 20
U.S. 26	8 40	8 65	9 90
22 and 24	8 25	8 50	9 75
18 and 20	8 10	8 35	9 60
16	7 95	8 20	9 45
14	7 85	8 10	9 35

Solder Makes Further Advances

LEAD AND ZINC PRODUCTS.—A marked scarcity of tin is developing in some quarters which may mean the closing down of some plants unless further supplies are available. Other sources indicate that tin stocks are still very fair and anticipate no immediate cessation of manufacturing activities. Higher prices have been established in some quarters on solder, due to the increasing strength of the tin market and the scarcity of this metal. Present quotations adopted, which provide for a wider range, are: Guaranteed, 53c to 58c per pound; strictly, 49¾c to 54c; commercial, 43¼c to 52c; wiping, 42c to 46c; wire, 51¼c. There is little change in the situation in respect to manufactured lead products. The demand is light, and prices remain unchanged, although the market on lead shows a somewhat easier tendency.

Lead pipe, lb.	$ 0 14	$ ....
Lead waste pipe, lb.	0 15	....
Lead traps and bends	Net list	
Lead wool, lb.	0 16	
Lead sheets, 3 to 3½ lbs. sq. ft., lb.	0 13¼	
Lead sheets, 4 to 8 lbs. sq. ft.	0 12½	

Cut sheets, ¾c lb. extra, and cut sheets to size, 1c lb. extra.

Solder, guaranteed, lb.	0 51	0 58
Solder, strictly, lb.	0 46¾	0 54
Solder, commercial, lb.	0 42	0 52
Solder, wiping, lb.	0 41	0 46
Solder, wire, lb.	0 51¼	....
Zinc sheets, per lb.	0 26	....

Old Materials Unsettled And Uneventful

OLD MATERIALS.—The position of old materials generally is one of uncertainty, and little action in either buying or selling is being taken by dealers. The attitude is more one of sitting back to await developments rather than going ahead on a basis which may prove absolutely futile. The future cannot be determined and conjectures are not even hazarded. Scrap metals, however, seem to show some activity and advances have been made in some lines. Car wheel scrap at $30.00 is $5.00 higher, and No. 1 machine scrap at $30.00 is also $5.00 up over previous quotations. There is an indication on the part of dealers in scrap metals to buy and business is reported fairly brisk.

Tea lead	$ 0 04½	....
Heavy lead pipe	0 07	0 07½
Yellow brass	0 12	0 13
Red brass	....	0 21
Light brass	....	0 09½
Heavy zinc	0 05½	0 06
Heavy copper	0 21½	0 22
Stove plate, per ton	17 00	18 00
Old cast iron, per ton	25 00	26 00

Tin Makes Advance; Spelter, Lead Lower

INGOT METALS.—An advance in tin has featured the metal markets since last issue. The uncertainty of permits being granted is adding a decided measure of firmness to the tin situation, and dealers are endeavoring to make equitable distribution, orders not being accepted for more than a ton at a time. Weakness marks the position of spelter during the week and further declines have been registered. Lead is also in easier tone. Production which was greatly accelerated to take care of war demands is now more than equal to the lessened demand existing, which explains the present weakness in both of the above metals.

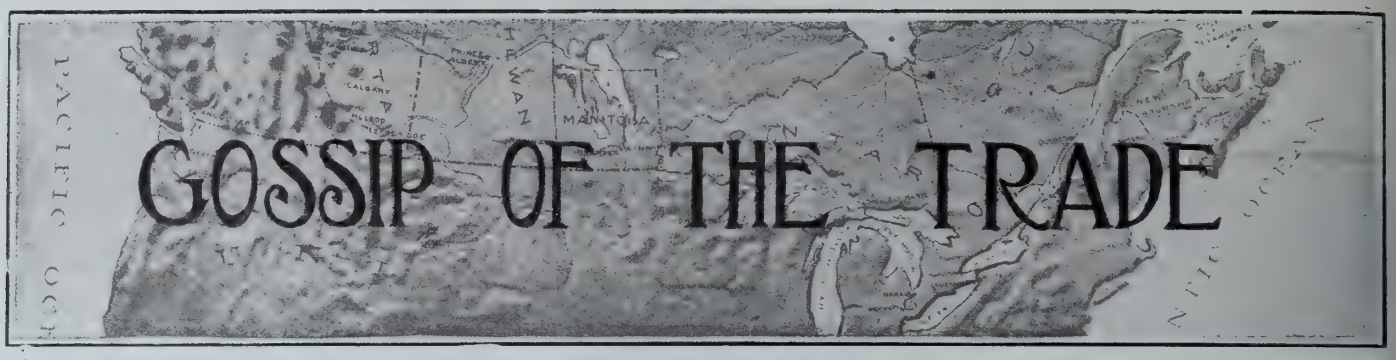
COPPER.—Nothing of material interest has developed in respect to copper. Domestic activity is at a minimum basis and prices remain unchanged. Some dealers look for a slightly higher basis of prices, but this will have little effect on the situation locally. Quotations at present range from 30c to 31c per pound.

TIN.—No improvement has been noted in the tin situation whatever. Stocks are getting down to the vanishing point. Dealers are endeavoring to make existing stocks go as far as possible, orders being held down to one-ton lots. Prices have advanced about 10c per pound and lowest quotation now being made is $1.05 per pound, with higher offers possible for guaranteed deliveries.

SPELTER.—A decidedly weak tone is noticeable in respect to spelter. A further decline of ½c has been made, prices now ranging from 8¾c to 9c per pound. Supplies are available in practically any quantity desired.

LEAD.—The market is somewhat easier again during the week, prices now being named at 8¾c to 9¼c per pound. The demand has shown a falling off from the large war business that has

(Continued on page 30.)



PERSONAL

Hon. Alphonse Verville, M.P., for many years had the honor of being the only labor representative in the Dominion Parliament. He was born in 1864, and served an apprenticeship as a plumber and steamfitter. For 11 years, 1882 to 1893, he lived in Chicago, but returned and at once led in the movement for the organization of labor. In 1906 he was elected for Maisonneuve, and again in 1911, while in December he was elected by an immense majority as Labor-Liberal candidate in a new Montreal riding, St. Denis, giving up his old seat to Hon. Rodolphe Lemieux. For some years Mr. Verville was president of the Trades and Labor Congress of Canada. He is the only member of the Montreal new civic commission who has had any direct civic experience, as he was a member of the tramways commission that drafted the new charter last year.

Ross McKinnon, who for some years occupied the position of manager of the Pease Foundry Company, and who has more recently had charge of the munition plant of the Page-Hersey Company of Guelph, has been appointed to the general managership of the Cohoes Rolling Mills at Cohoes, New York.

INCORPORATIONS

Vaudreuil Station, Que.—The Agricultural Cement Tile & Drainage Co., Ltd., has been incorporated with a capital of $25,000. W. S. Johnston, A. R. Hall and Wm. S. Wilson are the incorporators.

FIRE LOSS

Hamilton, Ont. — Fire damaged the plant of Moodie & Sons, Sanford Ave., to the extent of $25,000.

Hamilton, Ont. — Fire damaged the warehouse of the Eagle Spinning Mills to the extent of $10,000.

Elgin, Man.—Fire destroyed the Elgin Hotel, the post office and other store property recently. Damage to hotel buildings was $26,000.

STEAM HEATING EXPERT IN KITCHENER

Mr. Hal. C. Kimbrough, western manager of the American District Steam Co., of Chicago, with a main office in Tonawanda, N.Y., steam heating expert, visited Kitchener, Ont., recently. Mr. Kimbrough's mission was to investigate and report upon the local plant, following the previous visit of Mr. S. W. Pickford to Tonawanda. The expert and Mr. Pickford, met the consumers and discussed matters affecting the plant. The company which Mr. Kimbrough represents built the local plant.

HOUSES FOR BRANTFORD

At a meeting of the Brantford Board of Trade held recently, it was decided to launch a company under the auspices of the board for the erection of 100 workingmen's houses this summer. Local manufacturers expressed willingness to undertake the plan, owing to the great scarcity of houses in the city at present. The plan is to provide funds for the building of a standard type of house and the sale of the same on the instalment plan. Funds to amount to $100,000 have already been offered for the carrying out of the plan.

CONTRACTS AWARDED

Toronto, Ont.—Fred Armstrong Co., Ltd., has the plumbing contract awarded in connection with alterations to interior of warehouse for Silks, Ltd., 55 Bay Street.

Montreal, Que.—E. Tremblay, 25 St. Julie Street, has the plumbing contract in connection with the erection of a $70,000 factory for Montreal Pottery Co.

Cap de la Madeleine ,Que.—M. J. Quigley, Montreal, has been awarded the plumbing and heating contract in connection with the erection of an addition to building for the Canada Steamships Lines, 9 Victoria Square, Montreal.

Montreal West, Que.—Hickey & Aubut, 93 Dominion Street, have the plumbing, heating and ventilating contract in connection with the erection of a $183,000 high school for the Board of Education.

Barrie, Ont.—J. Wolferden, Bayfield Street, has the heating contract in connection with the erection of a collegiate institute for the School Board.

Montreal, Que.—E. B. Evans, 1112 St. Patrick St., has the plumbing and heating contract for alterations costing $18,000 to store and residence for the Burland Estate.

WATER METER MISTAKEN FOR GERMAN BOMB

For thirty minutes on a recent morning an innocent water meter disturbed a considerable portion of the populace of Edmonton, Alta., who feared the object was nothing less than a German bomb. The meter was much like a metal collar box in appearance and was first found lying in the gutter. A constable noticed the crowd and subsequently discovered the dangerous-looking metal box, which was the cynosure of all eyes. Although he paled as German-bomb tales flashed through his mind, he resolutely grabbed the metal contraption and carried it with his hands raised above his head to a nearby basement. There it was immersed in a bucket of water for half an hour while the curious ones thronged about the door where the officer had disappeared in expectation of at least a small explosion.

At the end of the thirty minutes, believing that all high explosives so certainly contained in the device, had been rendered harmless, the officer lifted forth his prize and stared into the dirty face of a city water meter, from which the majority of grime had now been removed by the action of the water. As the policeman left the building all anxious queries from the still waiting curious were received in stony silence.

BORDER TOWNS AIM TO PURIFY WATER

With a view to obtaining for the town of Sandwich, Ont., better water supply than it is at present receiving from the Windsor Water Works, Commissioner A. F. Healey, of the Essex Border Utilities Board, has induced that body to approve a resolution instructing the commission's engineer to prepare plans for a water works system that will be capable of supplying purified filtered water to Sandwich, Sandwich West, Ojibway and any other municipality within the jurisdiction of the commission.

Mayor Tuson, of Windsor, who is a member of the commission, declares that body is attempting to block plans of the Windsor Water Board to install electric pumps and lay new mains and hydrants at a cost of $40,000. Windsor, the Mayor says, will install a filtration system, but will not sell water to the Utilities Commission for distribution to the municipalities that are units of the commission.

For some time past water pumped through city mains is said to have been in such condition of turbidity that domestic users have been forced to purchase filtered water or small filtering plants of their own.

CONSTRUCTION

St. John, N.B.—The Booth Fisheries, Ltd., plan erection of a factory.

Toronto, Ont. — The Canadian Fairbanks-Morse Co. has applied for permit to erect a $7,000 warehouse building.

Winnipeg, Man.—The Winnipeg School Board is revising the plans of the three new schools to be built this summer.

London, Ont.—The London Art Woolwork Co. will expend $20,000 on additions to its plant.

William Head, B.C. — Tenders have been called for the construction of hospital buildings here by Department of Public Works at Ottawa.

Ponoka, Alta.—Tenders have been called for plumbing and heating for sick ward, Ponoka, by the Deputy Minister of Public Works, at Edmonton.

Montreal, Que.—Plans are under way by the military authorities to double the capacity of the military hospital at Ste. Anne de Bellevue, now being built.

London, Ont.—Plans have been prepared for an addition to the plant of the Peerless Hosiery, Ltd., on Adelaide St. at a cost of $20,000.

Montreal, Que.—Plans are being prepared for a new building for the Montreal Arena Company. Rebuilding will probably begin this summer. Cost is $250.000.

Ottawa, Ont.—It is reported that five tenders received by the Department of Public Works for the erection of a $1,-500.000 steel and reinforced concrete 700-room office building, have been unaccepted and that plans will be redrawn and new tenders called for. It is thought that the plans will be redrawn to conform with the Ottawa-Hull Federal District town planning scheme. The original plans called for a taller building than would be permitted under that scheme.

Fitzroy, Ont.—Tenders have been called for the erection of a brick school for the Public School Board.

St. John, N.B.—T. McAirty and Sons, Ltd., 13 King Street. are having plans prepared for an addition to their plant. Estimated cost, $500,000.

Montreal, Que.—Lamontagne Limited, 338 Notre Dame Street, West, contemplate the erection of a five storey factory.

Murray Bay, Que.—Lacroix & Nosworthy, 58 Cote du Palais, Quebec, are preparing plans for a stone and brick bank for La Bank Nationale, head office, 101 St. James St., Montreal.

Hartland, N.B.—Hatfield & Scott, Ltd., contemplate the erection of a brick bank building and offices costing between $10.000 and $12,000.

Hamilton, Ont.—Tenders are being received for the construction of a $50.000 two-storey brick warehouse for the Imperial Oil Company.

Bathurst, N.B.—Plans are being prepared for a bank for the Bank of Montreal, head office, 109 St. James Street, Montreal.

Sackville, N.B.—Main Street Baptist Church contemplates the erection of two additional wings and alterations to basement.

Stony Plain, Alta.—Stony Plain School District contemplate the erection of a consolidated school.

Tilbury, Ont.—The Town Council contemplate the erection of an addition to library building.

Toronto, Ont.—Tenders will be called shortly for the erection of a school for the Board of Education.

West Vancouver, B.C.—The erection of a church on Esquimault Avenue is contemplated.

Quebec, Que.—The Canadian Pacific Railway Company, Chateau Frontenac, will make alterations costing $500,000 to the Chateau Frontenac Hotel.

Regina, Sask.—Peart Bros. Hardware Co., Ltd., South Railway and Rose Street, contemplate the erection of a business block.

North Vancouver, B.C.—A by-law has been submitted for the completion of Queen Mary School at a cost of $11,500.

Orillia, Ont.—E. Long Mfg. Co., Queen Street, contemplate the erection of a two-storey factory building.

Vancouver, B.C.—The civic authorities contemplate the erection and equipment of a natatorium to cost $50,000.

Grand Prairie, Alta.—The Town Council have secured a site on which they will erect a Y.M.C.A. building.

Halifax, N.S.—Tenders are being received for repairs and alterations, costing $18,000, to the Institution for the Deaf and Dumb, Gottingen Street.

La Baie, Que.—The Assumption Sisters contemplate enlarging convent.

Montreal, Que.—Bigoness & Bigoness, 60 Notre Dame Street E,, will call tenders for the erection of a church for the Notre Dame Du Bon Pasteur.

Montreal East, Que.—Tenders are in for the erection of a fire and police station for the Town Council.

Moose Jaw, Sask.—Plans are being prepared for the new Merchants Bank building.

Montreal, Que. — Plans have been drawn for a $1,000,000 building for the Notre Dame Hospital. Work is not likely to proceed until after the war.

Montreal, Que.—The Canadian Pacific Railway have awarded J. H. Simmons, 506 Confederation Life Bldg., Winnipeg, the contract for the erection of five stations, and Harry S. Bears, 355 Boyd Ave., Winnipeg, the contract for the erection of four stations throughout Alberta and Saskatchewan.

Montreal, Que.—The erection of a $150,000 addition to Central Young Women's Christian Association Building is contemplated.

St. Alexis, Que.—Tenders will be called by the Roman Catholic Congregation for the erection of a $15,000 two-storey frame and brick presbytery.

Kingston, Ont.—The civic authorities have plans prepared for the erection of a public bathing house and the improvement of the water line and approaches to cost $15,000.

Lethbridge, Alta.—The Carnegie Trust Fund has offered $30,000 for the construction of a library.

Dartmouth, N.S.—G. Graham Creighton, Chronicle Building, Halifax, is preparing plans for a $200,000 school for the School Board.

Fernie, B.C.—The erection of a new school is contemplated at a cost of about $50,000.

Fraserville, Que.—Louis Cote and John F. Martin, Riviere du Loup Station, have the general contract for the erection of a $27,500 college for the Board of Education.

Grand Prairie, Alta.—The Imperial Oil Company, Ltd., Tegler Block, Edmonton, have secured a site on which they will erect a large warehouse.

Acton, Ont.—The Village Council contemplate the erection of a Carnegie library building.

Bridgewater, N.S.—Town Council plans the erection of a hospital.

Burlington Beach, Ont.—The Lakeside Hotel will be rebuilt of brick or cement.

WATERWORKS, SEWAGE, HEATING

Amherstburg, Ont.—The water filtration plant for Brunner-Mond, Canada, Ltd., is being handled by Morris Knowles, consulting engineer, Windsor, Ont.

Amherstburg, Ont. — Brunner-Mond, Ltd., will build waterworks pumping station to cost about $80,000.

Edmonton, Alta.—Special meeting of the Water Commissioners has been called to go into the report on water conditions.

Guelph, Ont.—The Sewerage and Public Works Commission has recommended the construction of sewers on Suffolk and Surrey streets.

Ojibway, Ont.—The Canadian Steel Corporation, Ltd., contemplates the construction of a water filtration plant.

Winnipeg, Man.—Construction of the city's section of the Greater Winnipeg Water District aqueduct will be started shortly.

York Township, Ont.—Council plans the trenching and laying of 12-inch water mains on St. John's road, Rogers road, Dufferin street and Lambton Ave.

Windsor, Ont.—Essex Border Utilities Commission have considerable sewer construction in prospect for the near future.

New Toronto, Ont.—The village council has decided to buy more filters for the waterworks department.

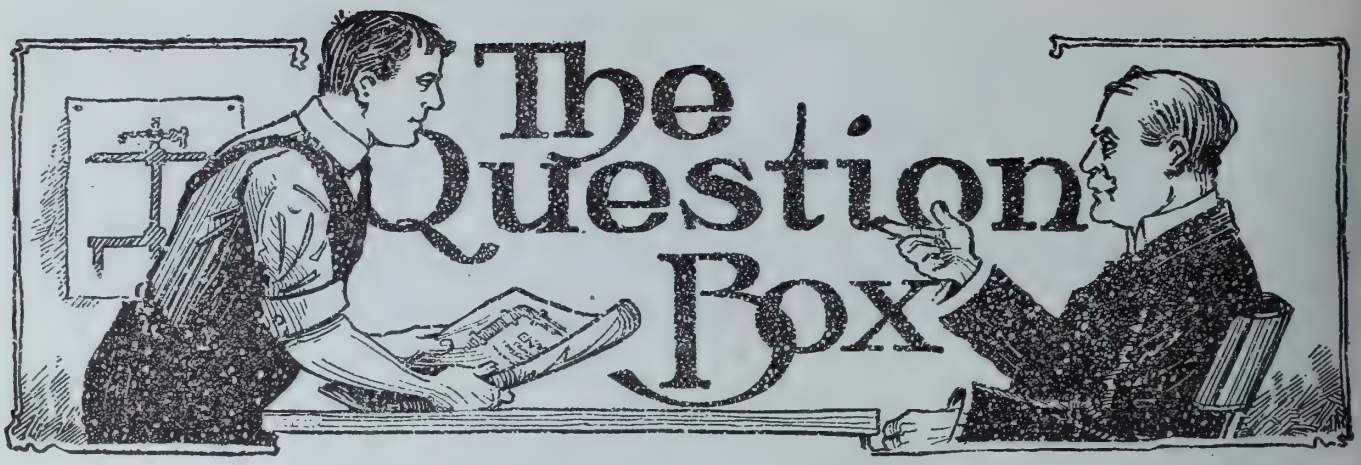
Moose Jaw, Sask.—The City Council has called tenders for the laying of an entire new two foot square wooden flume infiltration gallery, 1,350 feet long at the Caron Headwords, at a cost of $33,750.

Simcoe, One.—The township engineer has prepared detailed plans of the present and proposed surface drainage system for the town at an estimated cost of $100,000.

Weston, Ont.—Orders have been given for the installation of three filters at the pumping station.

Leamington, Ont.—Tenders will be called shortly for the construction of a reinforced concrete, 650,000 gallon capacity reservoir for the Town Council.

(Continued on page 30)



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

GATES FOR DOUBLE SETS OF ABSORPTION FIELD TILE BEDS

Editor SANITARY ENGINEER.

Some time ago there appeared an article describing sewage disposal systems, and reference was made to a number of gates of various types that could be used where a double system of absorption field tile had to be laid. I have to instal a small sewage disposal system, which I purpose laying out in such a way as will require to have the sewage discharge alternately, and would like to know if there is an arrangement that can be installed that will ensure the sewage being discharged first into one bed and then in the other without any fear of two discharges entering one absorption bed, one after the other. I understand that there is some form of syphons that discharge alternately, but in my case one syphon is already in use and is discharging into one system of pipes, and I want to add another bed. The present one is not large enough, and more field tile will have to be laid in another direction. S. D. S., B.C.

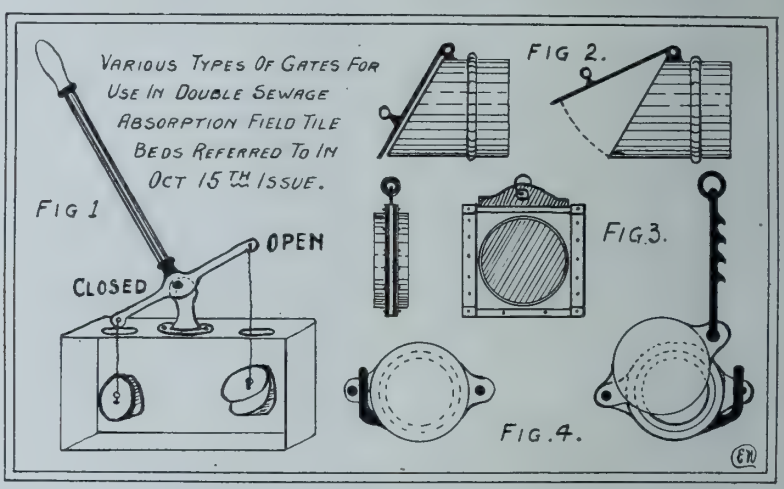
The article referred to appeared in SANITARY ENGINEER, October 15 issue, 1917. The accompanying illustration shows a number of types of gates which can be used for the purpose named.

Fig. 1 shows what could be termed a valve chamber. The discharge pipe from the syphon should be placed into one side of the chamber, and on the other side the two outlet gates should be fitted. If this chamber is made of cement concrete, these gates should be moulded into the concrete.

It will be seen that Fig. 2 shows the castings, one open and one closed. They are merely a pair of check dampers, and will answer the purpose very well, providing there is a sheet of rubber fastened on the face of the flap so as to make them reasonably watertight.

Fig. 3 shows another form of valve. Some types of furnaces have these kind of checks on the top of the smoke pipes, and the same kind of lever arrangement can be used, except that the connection between the slide in the check and the horizontal rod would have to be made of iron bar so as to operate the slides in the check.

Fig. 4 shows another kind of valve, which is often used when the discharge from a tank is operated by hand instead of by a syphon. The danger is that it is liable to be forgotten, and then the dosing chamber would overflow and spoil the action of the aerobic germs in the disposal bed.



Our inquirer is on the right track if he follows out the plan he has in view of making an additional bed and using a double valve chamber. Either valves, Figs. 1 or 3, will answer his purpose very well.—Editor.

HYGIENIC OUTRAGES

Man drinks whiskey that clogs the valves; he drinks beer, and that clogs the wheels; he downs lemonade, ginger ale, buttermilk, iced tea, coffee, ice cream, pickles and what not, and then wonders when his boilers burst. If you should take an ox and put him through a like performance he would be dead in a month. The simplest and plainest laws of health are outraged every day by the average man. Did Adam smoke? Did Eve wear a corset? Did Solomon chew tobacco? Did the children of Israel make for a beer garden after crossing the Red Sea? Did Rebecca chew chocolate bonbons and eat ice cream and call for soda water?

Adam was a perfect man, and was made perfect from head to heel—how long would he remain so after eating and drinking a few highballs before going to bed? Suppose he had slept in a bedroom five by seven, with the windows closed down, the doors shut and two dogs under the bed?

Suppose Eve had been laced up in a corset, worn tight shoes, hobble figleaves, and sat up all hours of the night eating chicken salad and Welsh rarebits, and trying to keep on four pounds of dead people's hair?

Evolution is a great thing. Custom makes everything tolerable and puts its stamp of approval even on polygamy. We have evoluted since Adam's time, and many customs have come and gone.

The laws of health are as inexorable as the law of gravitation, as exacting as eternal justice, as relentless as fate, and their violation is the beginning and cause of all disease, suffering and sin.

Health is the most desired of earthly blessings. When finally lost it cannot be purchased by uncounted millions, restored by the alienist or returned by the pulpit.



Rapidac Basin Cocks

Rapid Acting

HERE is another distinct MUELLER triumph—a Rapid-Acting Compression Basin Cock; a basin cock with a grace of line and beauty of design coupled with unusual strength and wear-resisting power. The handle is held to the stem by means of the MUELLER patented corrugations. These corrugations mesh perfectly and no amount of use will cause the handle to become loose or wobbly. A malleable iron washer on the shank locks the cock immovably to the lavatory in any position desired.

The MUELLER lines of rich, red brass goods are the means by which you can guarantee your customer maximum service minus the expense of repairs.

We have always realized that our first duty was to our Government. The war must be won. We have been working incessantly since 1914 in manufacturing munitions. Our output along these lines, totals over 55,000,000 brass forgings, but by expanding our capacity and equipment we have been able to take care of our regular line of business so that it has not suffered appreciably and at the same time we have been able to more than fulfill the demands of our munitions contracts. Mueller means service both to you and to your customer.

H. Mueller Mfg. Co., Limited

Sarnia **Canada**

MUELLER

GOSSIP OF THE TRADE

(Continued from page 27.)

Tilbury East Township, Ont.—Tenders have been called for the dredging of internal drains of the Ford Drainage Works for Township Council.

Chicoutimi Parish, Que.—Tenders are being received by the secretary-treasurer, Diego Villeneuve, for the construction of a $55,000 waterworks system for the Town Council.

Saskville, N.B.—Town Council contemplates improvements to waterworks system.

Southwold Township, Ont.—Township Council contemplates the construction of tile drains and culverts.

Malden Township, Ont.—Tenders have been called for the construction of the Collision and 8th Concession drains for the Township Council.

Matane, Que.—By-law will be voted on for waterworks system costing $75,000.

Brantford, Ont.—The Board of Works has advised the installing of storm sewers on St. Paul Avenue and Read Street.

Colchester South Township, Ont.—Township Council contemplates drainage work, costing $3,000.

Dartmouth, N.S.—The Town Council contemplates extension to water main at Lamonte Lake.

Amherst, N.S.—The Town Council contemplate alterations costing $7,000 to waterworks system.

Amherst, N.S.—The Town Council contemplate the construction of sewers at a cost of $10,000.

Merritton, Ont.—The Village Council is having data concerning costs, etc., for a system of sewerage prepared.

Toronto, Ont.—Tenders have been called for trenching and laying of 12-inch water main on St. Johns Road, Rogers Road, Dufferin Street and Lambton Ave. for the Township of York .

Matheson, Ont.—A new waterworks and sewerage system is contemplated.

Chatham, Ont.—A new incinerator has been installed at the Public General Hospital. It is one of the most modern type of incinerator.

Guelph, Ont.—The Sewerage and Public Works Commission has decided to recommend to the city council that a by-law be passed for the construction of a storm drain on Ontario street. A recommendation was also made to construct a sewer as local improvement on Meadow- the Dominion Shipbuilding Co., Ltd., Toronto.

Toronto, Ont.—The Canadian Incinerator Co., Ltd., Toronto, has the contract to erect two new heating furnaces for the Dominion Shipbuilding Co., Ltd., Toronto.

OBITUARY

Montreal, Que. — Z. Cusson, sanitary engineer, is dead.

MARKET CONDITIONS AND TENDENCIES

(Continued from page 25)

been handled, although advices from the States are to the effect that exports to England are in somewhat better volume.

ANTIMONY.—Dullness continues to mark the situation in respect to this metal. Little trading is being done and prices have held unchanged, showing a range of from 16c to 18c per pound.

ALUMINUM. — Government orders continue to absorb practically all surplus offerings of this metal for airplane construction, and commercial transactions are within a pretty narrow scope. The range of prices locally is wide, 50c to 60c per pound being asked.

PIG IRON.—The situation in some quarters seems to be slightly better, but is far from satisfactory yet. Reports from the United States indicate production for April will be about 85 per cent. of capacity, but this is being quickly absorbed. Scrap is being used in large quantities in Canada, and some manufacturers state that even this cannot be secured in sufficient volume to maintain operations at capacity. Nominally quotations on foundry iron are being made at $49.50 per ton.

Health is a state of physical, mental and moral equilibrium, a normal functionating of body, mind and soul. It is a pleasure when the world looks good and beautiful and the battle of life seems worth while. Health is the antithesis of disease, degeneracy and crime.



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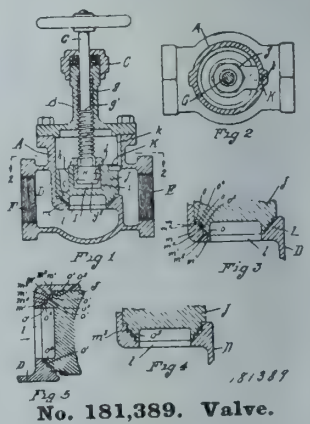
NEW CANADIAN PATENTS

No. 181,389.

Emanuel Fisher, Providence, Rhode Island, U.S.A., 1st January, 1918; 6 years. Filed 24th October, 1917. Receipt No. 286,776.

Claim.—In a valve, the combination of a valve seat comprising a series of steps of successively increasing diameter, and a valve member comprising a series of steps integral therewith and adapted to contact successively with the first steps in the order of increasing diameter of the latter and comprising acting faces of successively gradually increasing heights.

2. In a valve, the combination of a valve seat comprising a series of concentric steps of successively increasing diameter, and a valve member comprising a series of concentric steps integral



No. 181,389. Valve.

therewith and adapted to contact successively with the first steps in the order of increasing diameter of the latter and comprising acting faces of successively gradually increasing heights.

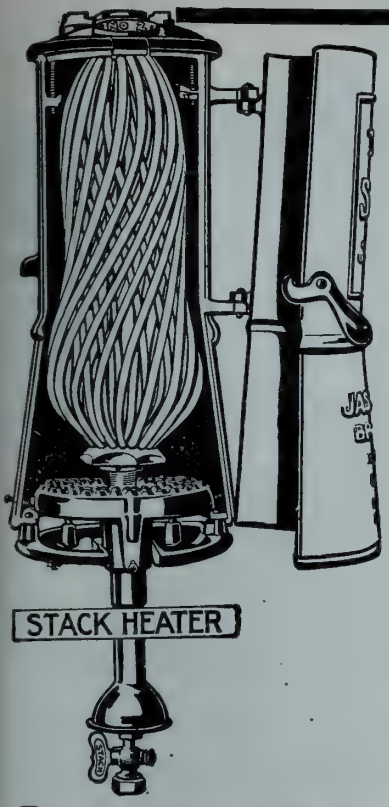
3. In a valve, the combination of a valve seat comprising a series of steps of successively increasing diameter, and a valve member comprising a series of steps integral therewith and adapted to contact successively with the first steps in the order of increasing diameter of the latter, the pairs of horizontal faces of the steps beyond the first steps being successively and gradually spaced apart increasing distances.

A POSTCARD FROM OVERSEAS

SANITARY ENGINEER got a surprise the other day when a postcard arrived from Private Clarence R. Paddon, of Windsor.

He is the youngest son of the original Robert Paddon, sanitary engineer, Windsor, Ont., and he informs us that he enlisted on January 8th, and was at the time of writing stationed at Bramshot Camp, Hants County. He was formerly a student of the American School of Correspondence and making splendid progress, and upon his return will continue his studies.

Private Paddon has a brother veteran, and will no doubt uphold not only the dignity of the Paddon family and the craft, but also that of a Canadian soldier. SANITARY ENGINEER hopes to hear from him often, and have the pleasure of reporting his safe return home.



OPEN IT UP AND SHOW THEM

The big feature of the Stack Gas Water Heater—the near perpendicular copper tubes in which the water is heated—is readily understandable. All that is necessary to a sale is to open up the Heater and show prospect. He can see at once that the water in those tubes is subjected to intense heat from the time it enters the heater until it passes out of the coil. He will understand how **small columns** of water will heat much more quickly than a **large coil,** especially when heated from all sides. He will be convinced that the Stack can heat water in one minute, and he'll buy because he's perfectly satisfied that he's getting the best heater on the market.

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FOR HEATING SYSTEMS

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MacLean's Magazine
For MAY

Canada at the Peace Conference

THE British Empire will have a representative or representatives at the Peace Conference. The question is—Who? Who will be Canada's choice? Will Canada have any part in that conference of momentous import? H. G. Wells, one of the greatest writers of the age, has written on the subject of who is to represent the Empire at the Peace Conference. He has written this article for MACLEAN'S MAGAZINE and it appears in the May issue. (Mr. Wells parcelled this manuscript and addressed it himself, for MACLEAN'S MAGAZINE.)

How Does a Retreating Army Behave?

GEORGE EUSTACE PEARSON tells how in the May MACLEAN'S. Mr. Pearson is a Princess Pat man, and was gassed at St. Julien. He is now lecturing for the American Government in Texas and elsewhere. He is a Toronto man, and his war stories are of sensational interest. The **Saturday Evening Post** has published two of his stories, and other American magazines will. Mr. Pearson is well known to readers of MACLEAN'S MAGAZINE, and this wonderful contribution to the May MACLEAN'S will be read with intensest interest. Mr. Pearson is a wonderful delineator of war.

Robert W. Service in the May Number

Service is perhaps Canada's best known poet. He is at the front, and ever since going there two years ago his verse has been appearing in MACLEAN'S MAGAZINE—a fine compliment to Canada and MACLEAN'S. In the May number he has a stirring ballad—"The Twa Jocks"—great stuff!

Stephen Leacock is There, Too

Mr. Leacock likes MACLEAN'S. He is loyal to Canada. He gives to the Canadian people the children of his fancy—and he makes this gift through MACLEAN'S MAGAZINE. "May-time in Mariposa" is his contribution to the May MACLEAN'S. Lou Skuce illustrates it.

A. C. Allenson has a Story

MR. ALLENSON is another Canadian whom the editors of American magazines appreciate, and show their appreciation by buying his stories. Mr. Allenson remains loyal to MACLEAN'S which has been his cradle, as it were. We rejoice to be able to say that we shall have many stories from this Canadian short-story writer. His story in the May MACLEAN'S is "Drop Behind and Lose Two"—amusing and tender. W. B. King, a Saturday Evening Post illustrator, has made the drawings that accompany Mr. Allenson's story.

The Departments Everybody Likes

MACLEAN'S MAGAZINE is liked by many because it has an admirable **Review of Reviews Department.** This department condenses for busyreaders the best things appearing in the leading magazines and reviews of Great Britain and the United States. * * * **Women and Their Work** is a department that satisfies women. Women are bearing so many of the world's burdens nowadays that their fields of endeavor and interest deserve the recognition which they receive in MACLEAN'S. * * * **The Business Outlook, The Investment Situation** and **The Nation's Business** are departments valued by the business man.

(Circulation of MACLEAN'S is now 60,000—10,000 more than it was six months ago.)

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Pipe and the Public Welfare

By R. C. McWane

A Book Just Off the Press

Every sanitary engineer should be the possessor of this book. It deals with pipe making of all kinds, cast iron, wrought iron, steel, wood and tile pipe. It is valuable because it gives the users of pipe a true idea of how pipe lasts under various conditions when in service.

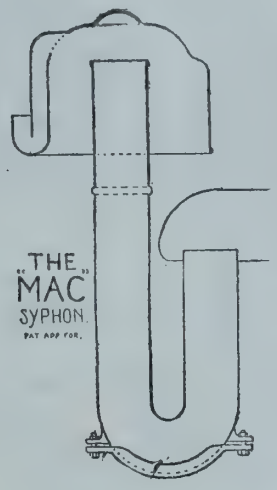
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Every syphon guaranteed to work automatically once it is primed.

Made in two sizes—3 in. and 5 in. Prices on application.

3 inch syphon discharges 90 gals. per minute.

5 inch syphon discharges 260 gals. per minute.

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Before you return you may need to turn a thread, make a bend, cut off an end or perform any of the other ordinary operations for which a steamfitter is usually summoned.
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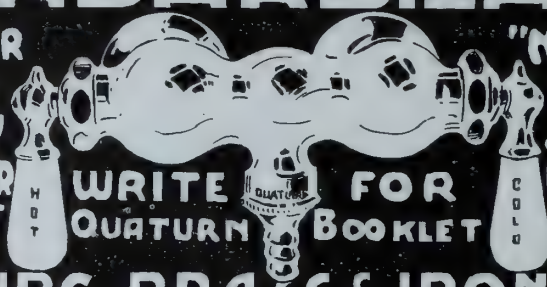
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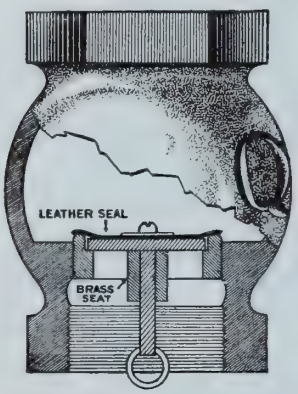


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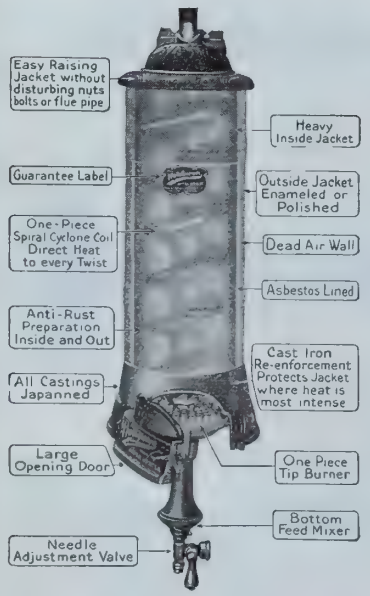
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GALT CANADA

Service - Speed - Economy



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BEST FOR BAD WATER

Quality Survives

Also Made With Cast Iron Jacket.

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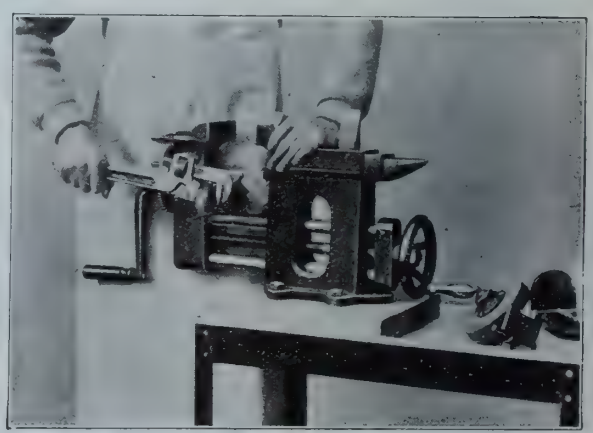
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An Equipment All in One



WEIGHS 90 POUNDS

The Equipment Comprises——

A Pipe Vise
A Bench Vise
A Bench Grinder
A Two-Speed Drill
A Hardy Cutter
An Anvil

It's not a toy. It's a real combination of practical tools for practical people.

Write for full particulars.

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King Boilers get up heat quickly

Very shortly after the fire is lighted in a King Boiler hot water reaches the radiators. The thin, peculiarly shaped waterways in the "King" mean quickly heated water and perfect circulation. The perfect circulation causes a saving in fuel because it obviates the necessity of "extra firing" to move cold water from the radiators.

The Trade should use this quick-heating, fuel-saving argument now while fuel is scarce and high in price.



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Head Office, FRASER AVENUE, TORONTO

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AGENCIES IN ALL LEADING CITIES

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Classified Buyers Guide

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Air Line Systems.
C. A. Dunham Co., Ltd., Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Air Valves.
Beaton & Cadwell Mfg. Co., New Britain, Conn.,
Beaton & Corbin Mfg. Co., Southington, Conn.
Canadian Wolverine Co., Ltd., Chatham.
C. A. Dunham Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.

Asbestos Goods.
James Morrison Brass Mfg. Co., Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Boilers, Steam or Hot Water.
Lord & Burnham Co., Ltd., Toronto.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.

Boiler Feed Regulators.
C. A. Dunham Co., Ltd., Toronto.
James Morrison Brass Mfg. Co., Toronto.

Brass Goods, Valves, etc.
Joseph Breeden & Co., Ltd., Birmingham, England.
Canadian Brass Co., Ltd., Galt, Ont.
Canadian Wolverine Co., Ltd., Chatham.
C. A. Dunham Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Limited, Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
Kerr Engine Co., Ltd., Walkerville.
H. Mueller Mfg. Co., Ltd, Sarnia, Ont.
L. Wolff Manufacturing Co., Chicago.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Brass Pipe and Tube.
Canada Metal Co., Ltd., Toronto
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Cellar Drainers.
Galt Brass Co., Limited, Galt.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

Chain Wrenches.
Trimont Mfg. Co., Roxbury, Mass.

Closets.
Canadian Brass Co., Ltd., Galt, Ont.
Canada Metal Co., Ltd., Toronto.
Cluff Mfg. Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Mfg. Co., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Standard Sanitary Mfg. Co., Ltd., Toronto.
L. Wolff Manufacturing Co., Chicago.

Country Residence Equipments.
Hurley Machine Co., Toronto.
Empire Mfg. Co., London.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

Damper Regulators.
C. A. Dunham Co., Ltd., Toronto.

Drainage Fittings.
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.

Drinking Fountains.
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Mueller Mfg. Co., Ltd., H., Sarnia.

Ejectors, Steam.
James Morrison Brass Mfg. Co., Ltd., Toronto.
Kerr Engine Co., Walkerville.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Enamelware.
Amherst Foundry Co. Ltd., Amherst, N.S.
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Standard Sanitary Mfg. Co., Ltd., Toronto.
Port Hope Sanitary Mfg. Co., Ltd., Port Hope
L. Wolff Manufacturing Co., Chicago.

Electric Pumping Machinery.
Empire Mfg. Co., Ltd., London and Toronto.
Hurley Machine Co., Toronto.

Fittings.
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Flushometers.
Canadian Brass Co., Ltd., Galt, Ont.
Canada Metal Co., Ltd., Toronto.
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Standard Sanitary Mfg. Co., Ltd., Toronto.
L. Wolff Manufacturing Co., Chicago.

Floor and Ceiling Plates.
Beaton & Cadwell Mfg. Co., New Britain, Conn.,
Beaton & Corbin Mfg. Co., Southington, Conn.
Canadian Wolverine Co., Ltd., Chatham.
Galt Brass Co., Ltd., Galt.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
James Morrison Brass Mfg. Co., Ltd., Toronto.
Steel & Radiation, Ltd., Toronto.

Gasoline Engines.
Empire Mfg. Co., London.

Gas Water Heaters.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Ltd., Galt.
Holstream Heater Co., Cleveland.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Pittsburg Water Heater Co., Toronto.

Generators.
James Morrison Brass Mfg. Co., Ltd., Toronto.

Heaters.
Lord & Burnham Co., Toronto
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal and Toronto.

Lead.
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Ltd., Galt.
Hoyt Metal Co., Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

Mixing Valves.
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Port Hope Sanitary Mfg. Co., Ltd., Port Hope.

Monkey Wrenches.
Trimont Mfg. Co., Roxbury, Mass.

Packing.
Canadian Wolverine Co., Ltd., Chatham.

Packless Radiator Valves.
Kerr Engine Works, Walkerville.

Pipe and Radiator Hangers.
Beaton & Cadwell Mfg. Co., New Britain, Conn.,
Beaton & Corbin Mfg. Co., Southington, Conn.

Pipe, Black and Galvanized.
Canadian Tube & Iron Co., Ltd., Montreal.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.

Pipe Cleanser
Chamberlain Desolvo Co., Ltd., Toronto.
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London and Toronto.

Pipe Cutters.
Borden Canadian Co., Ltd., Toronto.
Trimont Mfg. Co., Roxbury, Mass.

Pipe Joint Compounds.
Canadian Wolverine Co., Ltd., Chatham.
James Morrison Brass Mfg. Co., Ltd., Toronto.

Pipe, Soil, and Fittings.
Anthes Foundry Co., Toronto and Winnipeg.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Toronto Hardware Mfg. Co. Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.
Warden King, Ltd., Montreal.

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John Hall & Sons, Ltd., Brantford.
A. B. Jardine & Co., Hespeler.

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Trimont Mfg. Co., Roxbury, Mass.

Porcelain Ware.
Canada Metal Co., Ltd., Toronto.
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Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
L. Wolff Manufacturing Co., Chicago.

Pumps.
C. A. Dunham Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Ltd., Galt.
Hurley Machine Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Cornbrook, Manchester, England.

Radiators.
Lord & Burnham Co., Ltd., Toronto.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.

Radiator Foot Rests.
Beaton & Cadwell Mfg. Co., New Britain, Conn.,

Radiator Traps (Steam).
C. A. Dunham Co., Ltd., Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Range Boilers
Toronto Hardware Mfg. Co., Toronto.

Reducing Pressure Valves.
C. A. Dunham Co., Ltd., Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Roof Flanges and Flashings.
Canada Metal Co., Toronto.
Simplex Manufacturing Co., Chicago.

Rubber Goods
Canadian Consolidated Rubber Co., Ltd., Montreal.

Septic Tank Valves and Syphons.
Anthes Foundry Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

Solder.
Canada Metal Co., Ltd., Toronto.
Hoyt Metal Co., Toronto.

Steam Specialties.
Dart Union Co., Ltd., Toronto.
C. A. Dunham Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Kerr Engine Co., Walkerville, Ont.
James Morrison Brass Mfg. Co., Ltd., Toronto.
United Brass Founders and Engineers, Ltd., Cornbrook, Manchester, England.

Steam Traps.
Geo. W. Cole Co., Ltd., Toronto.
C. A. Dunham Co., Ltd., Toronto.
Farnsworth Co., Conshohocken, Pa.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Smoke Test Machines.
James Morrison Brass Mfg. Co., Ltd., Toronto.

Testing Plugs.
James Morrison Brass Mfg. Co., Ltd., Toronto.

Tools.
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Trimont Mfg. Co., Roxbury, Mass.
Williams, J. H., & Co., Brooklyn, N.Y.

Unions.
Canada Metal Co., Ltd., Toronto.
Dart Union Co., Ltd., Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Vapor Heating Systems.
C. A. Dunham Co., Ltd., Toronto.
Moline Heat, Moline, Ill.

Vitro Tanks.
Galt Brass Co., Galt.

Vacuum Systems of Heating.
C. A. Dunham Co., Ltd., Toronto.

Water Supply Systems.
Empire Mfg. Co., Ltd., London and Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.



Wolff Installation, Goodman Plant, Chicago, Ill.

INCREASED EFFICIENCY in factories, business houses and schools follows the installation of high-grade plumbing, which insures the best sanitation and improved working conditions.

Wolff Plumbing

is the plumbing that makes for efficiency. It has been the standard of quality for over 60 years. It measures up to every requirement of the modern building. Write for catalogue.

L. Wolff Manufacturing Company

Manufacturers of Plumbing Goods Exclusively

General Offices: 601 W. Lake Street CHICAGO Showrooms: 111 N. Dearborn Street

Lowering the Cost of Getting Orders

THEY were talking about the high cost of getting orders—were Brown and Jones. They were agreed on some things: train service was interfering with ability of salesmen to call on as many as formerly; hotel bills were adding heavily to the weekly expenses of salesmen; congested freight and express service was interfering with quick deliveries; salaries of men were going up; labor of all sorts, as well as materials, was becoming higher-priced.

Then Brown said: "I am giving a good deal of thought to the training of my salesmen. I am endeavoring to make them produce more business—to sell more goods, and to reduce the number of futile calls. I notice that they are giving much attention to this subject in the United States, and that in Canada some firms are paying serious attention to this matter of better salesmanship."

"What are you doing?" said Jones.

"Well, I haven't done a great deal so far, for I am in the initial stages of my studies. But one thing I have learned: it is that my men haven't been analyzing the causes of their failures to make sales. I can't blame them, for I myself haven't troubled myself to dig into this phase of the selling game. Now I am asking myself and my men—Why the failure to get the order?

"I have discovered a good deal. One thing is that my men haven't known enough about the goods they took out to demonstrate them convincingly. This is largely our fault. So we are using time and printed matter to make our men know exactly what they have to offer.

"Another thing we have had impressed on us is that our men haven't been approaching their prospects always in the best way. They have been too keen to sell rather than to serve.

"I saw a thing the other day that is good—by a man named Casson. He said the average salesman's method was "Talk—Argue—Compel.' As against this, he recommended: Listen—Agree—Oblige.

"What he means is that the salesman must get on the side of the buyer if he is to have best results. And so I am doing something to get my men trained to acquire the point of view of the man they canvass—this first. When a salesman postpones his sales talk until he has won the interest and attention of the prospect, he is in a much more favorable position to put across his proposal.

"I read recently an advertisement of the FINANCIAL POST in which it told of Frank Mutton, President of the International Business Machines Company, in which he said that he has subscribed to THE POST for each of his salesmen in order that they may be well informed about business conditions and affairs in Canada—this as an aid in making sales. The idea, I infer, is to make his men quick to get the point of view of the men they are to canvass—to become possessed of a kind and amount of information which will enable them to make themselves interesting to prospective buyers of time-recording machines.

"Now, I have known Mutton for many years—known him to be a super-salesman. In subscribing to THE POST for his salesmen, I saw one of his methods—secrets, if you like. So I got THE POST myself to see how my men could make use of it for the same objects.

"I have subscribed to THE POST for 4 months at the cost of a dollar per salesman, and I have been having my men report to me in writing just how they are finding The POST useful to them. They read THE POST with one question uppermost: What item or article in this issue can be used by me to help me make sales?

"I want to tell you, Jones, that I am delighted with the experiment. The minds of my men have been stimulated. They are "cashing in" on what they read. They relate certain items or articles to certain prospects, and they are approaching their customers with greater confidence, greater art, and with more persistency, born of a surer knowledge of how our product is worth the other man's consideration and purchase.

"My men are bringing in more business, and this offsets the increasing costs of going after business."

* * * *

A VERY suggestive conversation, is it not? The point of its reproduction here: If you think the idea put into operation by Brown (and Mutton who is paying for 50 subscriptions for men in his employ) is worth your consideration, then investigate THE POST for yourself. Instruct us to send THE POST to you that you may investigate it from the angle—What is there in this paper that my men can use to help them "get next" their prospects with a view to making more sales and in quicker time?

So we suggest to you that you sign the coupon below.

Just what does the FINANCIAL POST aim to do? The answer is: It gives business men information about every important happening in every part of Canada as this happening relates to Business. It follows the various listed and unlisted securities, and gives each week clear and accurate and up-to-the-minute information about them. It tells about the movements and influences affecting such groups of investment interests as Iron and Steel, Textiles, Milling, Pulp and Paper, Transportation, and so on. It has numerous contributed articles of first-class interest and importance. It contains much personal matter—notes and sketches about men of influence or position in the public eye whose doings or sayings have relation to Business. Withal, THE POST is extremely readable. It is edited and prepared by trained journalists—the highest-priced staff of men on any publication in Canada. All this makes THE POST a "different" paper, and a good one. The subscription price is $3.00 (52 issues—Saturdays); or 4 months for one dollar.

The MacLean Publishing Company, Ltd.,
143-153 University Avenue, Toronto.

Send me THE FINANCIAL POST (weekly, every Saturday). Subscription price of $3 will be remitted on receipt of invoice in the usual way. Have addressed to

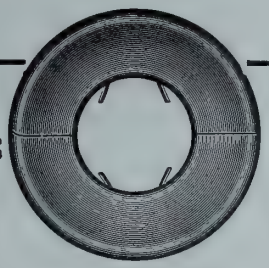
.....

S. E. .....



OPEN VIEW
NO. 10-A.

The CEILING PLATE that's better



TOP VIEW
NO. 10-A.

THE NO. 10—A NARROW FLANGE PLATE IS A STEEL HINGED PLATE. FLANGES ¾" WIDE. HIGHLY FINISHED. ESPECIALLY DESIGNED FOR TWIN CONNECTION "NARROW."

The split ceiling plate is coming more and more into use than ever and ALWAYS GIVES A NICE FINISH, because it can be attached to mains and risers at the very last, and is not exposed during completion of a building on the floors.

High quality at the right price.



Gem No. 4.

Gem No. 4 Automatic Air Valve

Made from the best brass obtainable. Pressed shell and pressed brass base which eliminate danger from blowholes, which is a fault with cast bases.

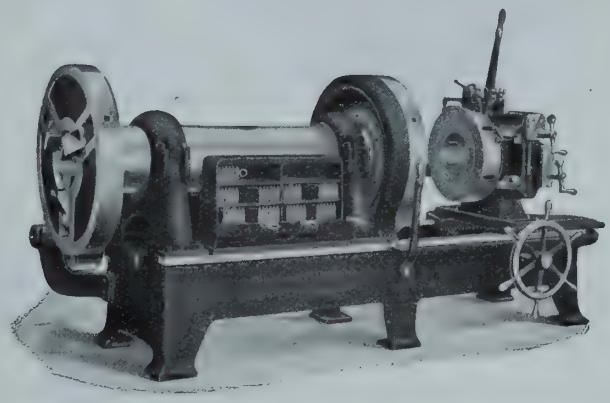
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The BEATON & CADWELL MANUFACTURING Co.

New Britain, Conn.

Eastern Agent: J. R. Devereux & Co., 358 Beaver Hall Square, Montreal. Western Agent: A. E. Hinds & Co., Chamber of Commerce, Winnipeg.

Pipe Machines of Merit



THE HALL No. 8

Duplex Improved Gear Box Driven. Capacity 2½ in. to 8 in. inclusive.

Note the drive belt at rear out of operator's way. Elevated die cabinet, control lever and speed levers all convenient to operator's right hand. Sliding die head.

These machines are equipped with a friction clutch, enabling operator to revolve pipe a few inches, if necessary.

Pipe Machines ranging from ⅛ to 18".
Nipple Machines ranging from ⅛ to 4".
Roller Pipe Cutters ranging from ⅛ to 4".
Delivery from stock.

Write us for full particulars and prices.

John H. Hall & Sons, Ltd., Brantford, Can.

WROUGHT PIPE

BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.
All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES Black and Galvanized All Sizes

Ask your jobber for CT Brand

CANADIAN TUBE & IRON CO., LIMITED

Montreal Works: Lachine, Can.

After the War——What?

The time to put on fire insurance is before the fire. The time to prepare for after-the-war conditions is before peace comes.

Advertise now and be prepared to keep your goods in demand through the medium of SANITARY ENGINEER.



PIPE THREADING AND CUTTING TOOLS

One Man Can Thread up to 12 Inch.

You cannot afford to expect your men to make horses of themselves. If they did they could not keep it up. Our tools save time, do better work and makes life worth living for your men.

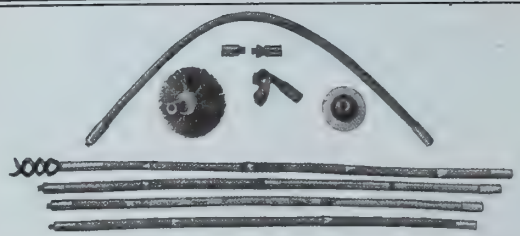


Cuts Without Burring

No. 1 cuts from ⅛″ to 1″
No. 5 cuts from ½″ to 2″
No. 10 cuts from 2½″ to 4″
No. 15 cuts from 4″ to 6″

Ratchet	Geared
No. 6—¼″ to ¾″.	No. 41—2½″ to 4″.
No. 25—1″ to 2″.	No. 61—2½″ to 6″.
No. 26—1″ to 2″.	No. 80—4½″ to 8″.
	No. 90—9″ to 12″.

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TORONTO, CANADA



Rogers Malacca Cleaning Rods

for cleaning boiler tubes, chimney flues, soot chambers and underground fitings—saves excavating. Fitted with Scraper, Brush, Screw and Plunger.

DARLING BROTHERS LIMITED
120 PRINCE STREET - - MONTREAL

IT IS IMPORTANT!

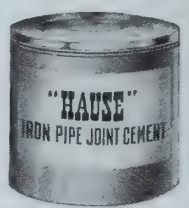
If you have something to dispose of in goods or service that as many buyers as possible get to know you and your product. This can be accomplished through

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143 University Avenue, Toronto

"HAUSE" PIPE JOINT CEMENT

For steam, water, air, oil, gas, gaskets, etc. The cement that cements. Sets like gum. Allows no leaks.

The Great Value of "HAUSE PIPE JOINT CEMENT" lies in its peculiar chemical properties which permits of its hardening and expanding after the joints are made up. In making up joints it has the same effect as a lubricant on the best graphite, and while the joints may be made and broken readily, a perfectly tight joint is maintained at all times. Comes in 1-lb., 5-lb., 15-lb., 25-lb., 50-lb. cans, 100-lb. barrels. Manufactured in ready mixed and powder form. Ask your jobber for prices, or write us direct.



Manufactured in Ready Mixed and Powder Form.

Made in Omaha, Neb., U.S.A., by

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It's a real little wind engine



VENTILATOR
Is a positive suction fan that ventilates

The "Bicalky" will dispense with all auxiliary heaters on local ventilation systems.

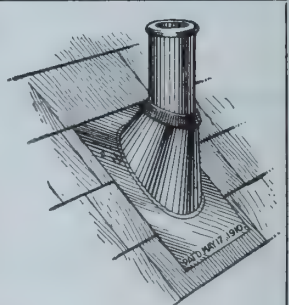
It is, as far as we know, the most scientifically constructed, self-propelled fan ventilator on the market.

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Canadian Sales Agents:
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Fits any roof from ½ pitch to flat—just slide it down the pipe and it will conform with the pitch of the roof.



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Our No. 15 style narrow flange designed for the Canadian trade.

One of many styles



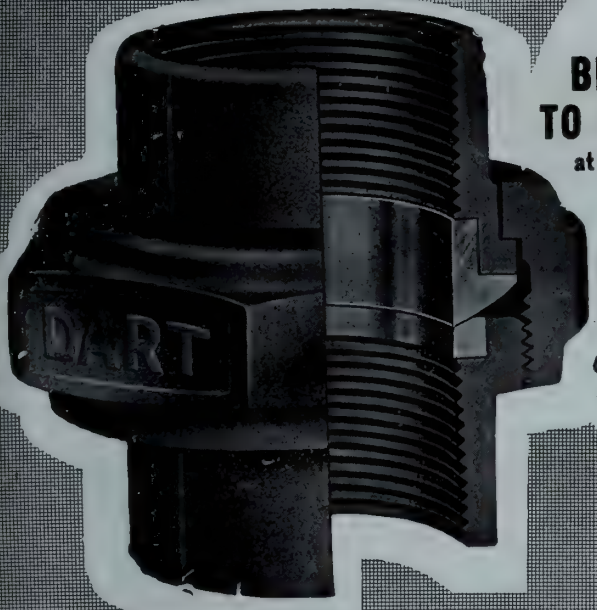
No. 15

Handsomely nickel-plated or plain Sizes ½ to 2″

Stock now carried by our Canadian Representative
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Southington, Conn., U.S.A.

"DART" UNIONS



"DART" BRONZE-TO-BRONZE AT THE JOINT MEANS NO DETERIORATION

And "Dart" Heavy Iron Parts means no stretching or pulling apart.

No upkeep cost, no replacement cost and no loss from leaks — these are conspicuous features of Dart Union Pipe Couplings. Whether pipes are in or out of line Dart Unions are EASILY CONNECTED.

BRONZE TO BRONZE at the Joint



Our Trade Mark (Your Guarantee) is cast on all Dart Unions.

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Dart Union Co., Ltd.

Toronto, Canada

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but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.

Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.

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THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario

Why Buy A Copper Lined Tank?

GOLDEN OAK



Plate C101

YES, WHY BUY A COPPER-LINED TANK ?

When you can buy "Vitro." A tank without lining. A tank that is made of material that is not liable to absorb moisture. All in one piece and never has to be repaired. The **"Vitro" no-trouble** tank is made right to stay tight.

READ THIS GILT EDGE GUARANTEE

A new tank will be given to replace one that at any time proves defective from either material or defective workmanship.

Write us for a Vitro catalogue

Galt Brass Company, Limited

Galt, Canada

SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

Vol. XII. Publication Office, Toronto, May 15, 1918 No. 10

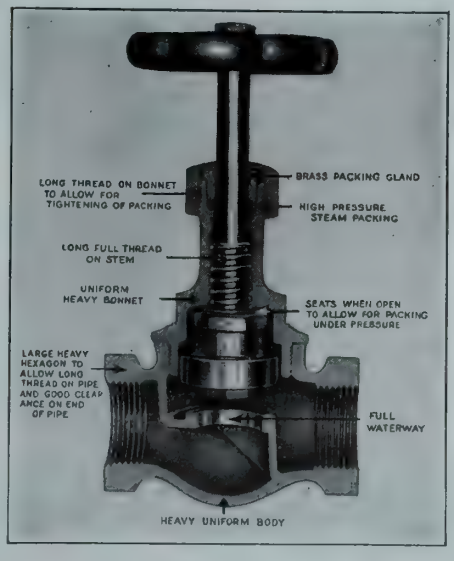
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We can make prompt shipments from stock. Let us quote you our prices on your next brass goods requirements.

When writing us or ordering from your jobber, ask for the EMCO GLOBE VALVE. It's a winner and we're proud of it.

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A Beaver Brand Pedestal
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A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

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Made in Canada



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It is Evidence Like This



"Toledo" Geared Adjustable Threading Tool No. 2 making a cut and thread on a 4-inch bend in position. It was desired to install a steam separator above throttle of engine, and the whole job was satisfactorily completed without removing the pipe line.

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"Jardine" and "Toledo" Pipe-Threading Tools cut clean, sharp threads with a minimum of muscular effort. They permit of one man doing work which ordinarily requires two. But even more important than this, they will work in any odd corner. Instance the job illustrated in the accompanying engraving. Here is a case where, with an ordinary tool, the whole pipe line would have had to be taken down. The tool paid for itself on that one job.

Investigate "Jardine" and "Toledo" Tools yourself. Ask us to send names of users in your locality. Then go and talk to these men in your own business and learn what they think of these good tools.

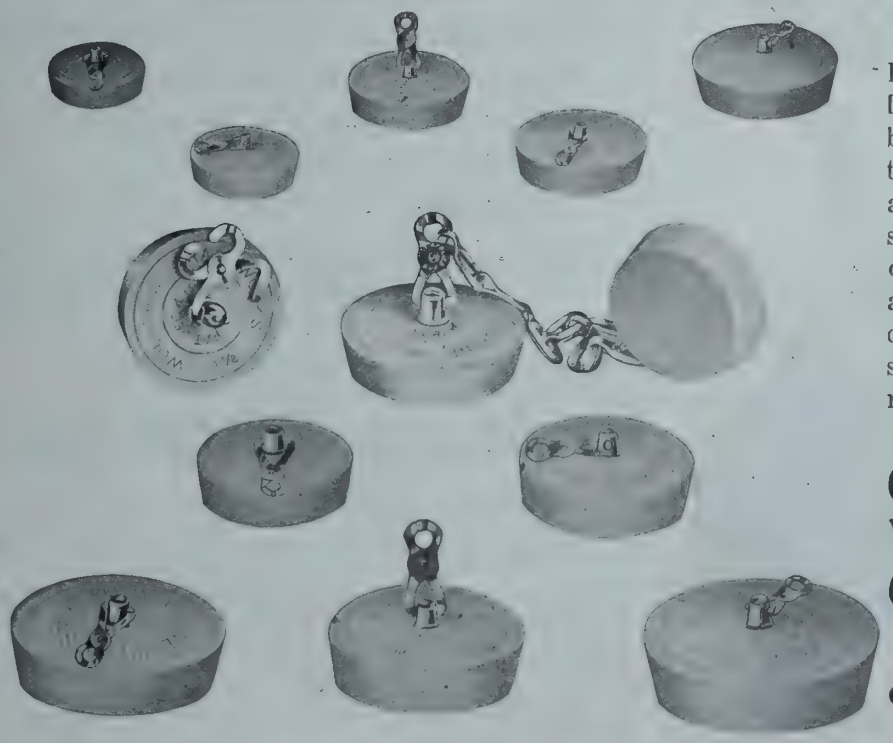
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Sole makers of "Jardine" Pipe-Threading Tools.
Sole licensees to manufacture and sell Toledo Pipe-Threading Tools in Canada.
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"C" Catalog "C" **WITH DOUBLE LOCK LINK SANITARY AND LASTING** **"C" Catalog "C"**

Wolverine Rubber Plugs are an extra quality White Rubber to withstand the hottest water and will not crack nor crumble.



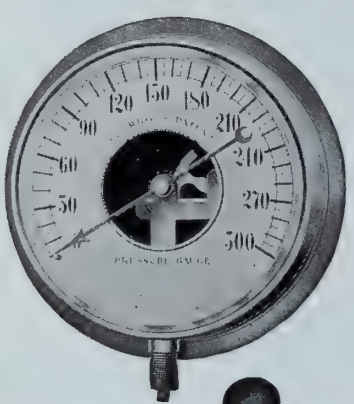
Double Lock Link will not become detached in use, as the locking spring ends overlap, and are held by chain, also by snapping into notched end.

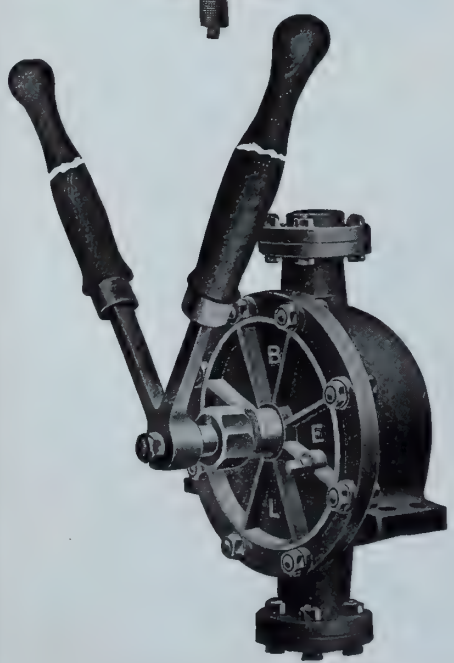
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Cornbrook, Manchester, England

It is our intention after the War to devote our energies to the intensive production of the following Specialities:

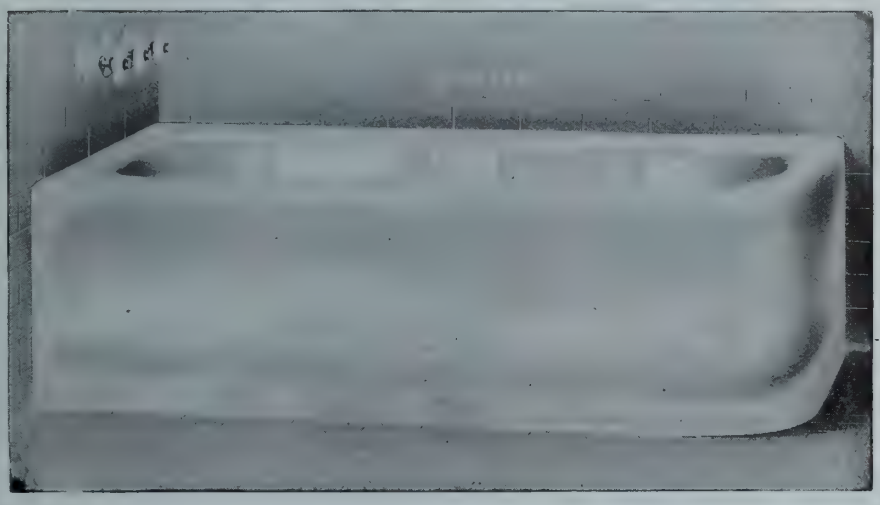
- Gunmetal and Brass Valves and Cocks.
- Steam, Water and Compressed Air Fittings generally.
- Cast Iron Stop and Sluice Valves.
- Semi-Rotary Pumps.
- Extruded Brass and Bronze Bars.
- Brass Bolts and Nuts, Studs and General Turned Work from the Bar
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- Injectors, Engine Governors.
- Spraying Machinery.
- Coppersmiths' Work.
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If you are interested in any or all of the lines mentioned and are in a position to take a hand in the energetic distribution of the same, please communicate with us NOW to our Head Office at the above address.

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"Perfection" Built-In Baths

Made in One Piece Enamelled All Over



These Baths represent the last word in design and finish, and are made to build into Right or Left Hand Corner or into a Recess.

The "Perfection" Built-in Bath is only 17½ inches high, therefore convenient. It builds into walls and floors, the absence of all dust-collecting cracks and corners, meaning bathroom sanitation.

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Vancouver:
847 Beatty Street

"MADE IN CANADA"

Becoming a Bigger Man

WHAT is the difference between some men you know and others known to you? Why are some men earning $3,000 a year and some $30,000? You can't put it down to heredity or better early opportunities, or even better education. What, then, is the explanation of the stagnation of some men and the elevation and progress of others?

We are reminded of a story. A railroad man, born in Canada, was revisiting his home town on the St. Lawrence River. He wandered up to a group of old-timers who sat in the sun basking in blissful idleness. "Charlie," said one of the old men, "they tell me you are getting $20,000 a year." "Something like that," said Charlie. "Well, all I've got to say, Charlie, is that you're not worth it."

A salary of $20,000 a year to these do-nothing men was incredible. Not one of the group had ever made as much as $2,000 a year, and each man in the company felt that he was a mighty good man.

Charlie had left the old home town when he was a lad. He had got into the mill of bigger things. He developed to be a good man, a better man, the best man for certain work. His specialized education, joined to his own energy and labor sent him up, up, up. To put it in another way: Charlie had always more to sell, and the world wanted his merchandise—brain, skill and ability. Having more to sell all the time, he got more pay all the time.

Charlie could have stayed in the old home town; could have stagnated like others; could have been content with common wages. In short, Charlie could have stayed with the common crowd at the foot of the ladder. But Charlie improved himself and pushed himself, and this type of man the Goddess of Fortune likes to take by the hand and lead onward and upward.

Almost any man can climb higher if he really wants to try. None but himself will hold him back. As a matter of fact, the world applauds and helps those who try to climb the ladder that reaches towards the stars.

The bank manager in an obscure branch in a village can get out of that bank surely and swiftly, if he makes it clear to his superiors that he is ready for larger service and a larger sphere. The humble retailer can burst the walls of his small store, just as Timothy Eaton did, if he gets the right idea and follows it. It is not a matter of brain or education so much as of purpose joined to energy and labor. The salesman or manager or bookkeeper or secretary can lift himself to a higher plane of service and rewards if he prepares himself diligently for larger work and pay. The small manufacturer, the company director, the broker—all can become enlarged in the nature of their enterprise and in the amount of their income,—by resolutely setting themselves about the task of growing to be bigger-minded men.

Specialized information is the great idea. This is what the world pays handsomely for. And to acquire specialized information is really a simple matter, calling for the purposeful and faithful use of time. This chiefly.

One does not have to stop his ordinary work, or go to a university, or to any school. One can acquire the specialized information in the margin of time which is his own—in the after-hours of business. Which means: If a man will read the right kind of books or publications, and make himself a serious student at home, in his hours—the evening hours or the early morning hours—he can climb to heights of position and pay that will dazzle the inert comrades of his youth or day's work.

IF business—BUSINESS—is your chosen field of work, we counsel you to read each week THE FINANCIAL POST. It will stimulate you mentally. It will challenge you to further studious effort. It will give you glimpses into the world of endeavor occupied by the captains of industry and finance. With the guidance of the POST, and with its wealth of specialized information, you, a purposeful man, aiming to go higher in life and pay, will find yourself becoming enlarged in knowledge and ambition, and will be acquiring the bases and facts of knowledge which become the rungs of the ladder you climb by.

It is the first step which costs. But this cost is trivial—a single dollar. We offer you the POST for four months for a dollar. Surely it is worth a dollar to discover how right we are in our argument. If you have the will to go higher in position and pay, sign the coupon below.

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Money to be enclosed / remitted.

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"ARISTOCRAT" LAUNDRY TUB

We know this because we have combined every ingredient and every feature necessary to make up a perfect tub. We are receiving many repeat orders which prove that those who have already bought are pleased.

REPEAT ORDERS COUNT EVERY TIME

Every ARISTOCRAT laundry tub you install will sell others for you. Let us send you a sample tub.

THE PRICE IS RIGHT

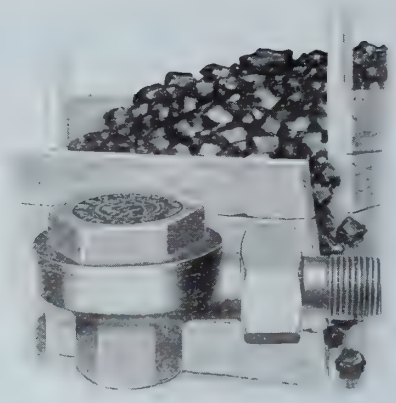
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WE HAVE EVERYTHING FOR THE PLUMBER

CATALOGUE "A" MAILED FREE



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Where radiators are equipped with Dunham Radiator Traps there is a constant dependable check on the coal bin. The Dunham Radiator Trap saves coal from being wasted. It gets every last bit of heat out of the fuel. It is more than doing its share in helping the Dominion save millions of tons of coal this year.

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By equipping coal-wasting heating systems with Dunham Radiator Traps you can, in many cases, convert them into coal-saving systems.

This means business for you **now** and still **more** when building operations are resumed.

Write for full information about The Dunham Heating Service and about the Inspection Service we maintain for heating engineers, contractors and steamfitters.

The DUNHAM HEATING SERVICE

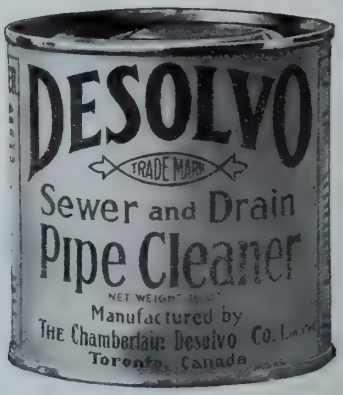
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And there's nothing else just like it.

Use Cold Water

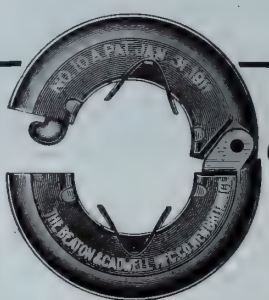


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If you have not yet tried out DESOLVO you cannot realize how effective it is for clearing choked drains, waste and soil pipes. Everybody that has used it swears by it as being the real stuff and declares there is nothing else like it. If you have not used DESOLVO, write us to-day on your letterhead for free trial can.

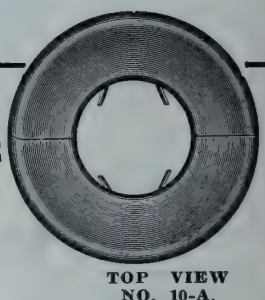
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The CEILING PLATE that's better



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The split ceiling plate is coming more and more into use than ever and ALWAYS GIVES A NICE FINISH, because it can be attached to mains and risers at the very last, and is not exposed during completion of a building on the floors.

High quality at the right price.

Gem No. 4 Automatic Air Valve

Made from the best brass obtainable. Pressed shell and pressed brass base which eliminate danger from blowholes, which is a fault with cast bases.

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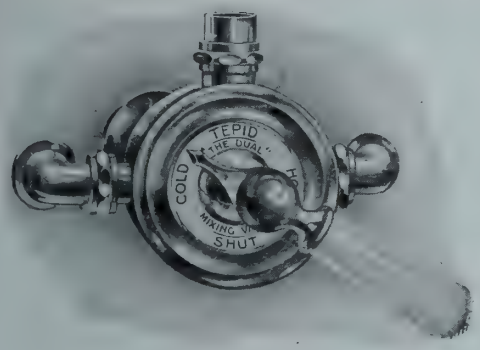
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"Dual" Mixer

A valve that really mixes Hot and Cold Water, and maintains a uniform mixture.

For ease of operation, simple construction and easy installation, it has set a new standard of efficiency.

Cold Water must be turned on first, no possibility of scalding.

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SANITARY ENGINEER
PLUMBER AND STEAMFITTER OF CANADA

Vol. XII. TORONTO, MAY 15, 1918 No. 10

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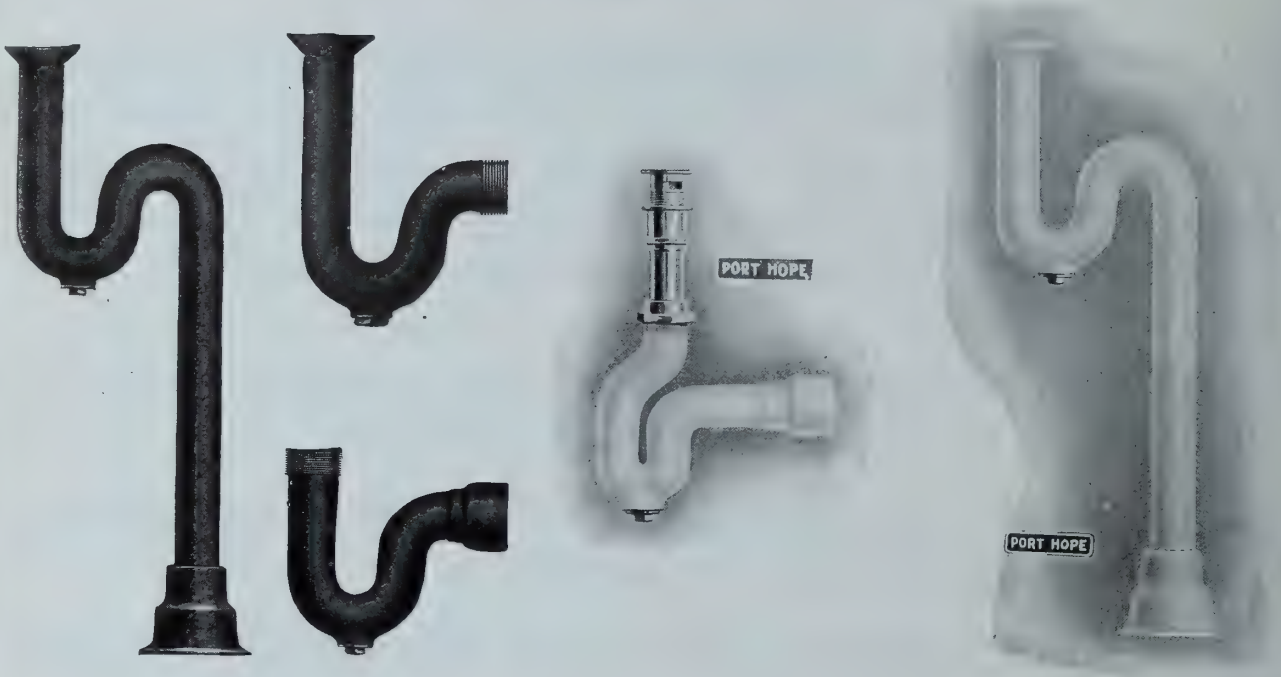
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Education of the Apprentice

Being Part of an Address Delivered Recently Before the Illinois Master Plumbers at Their Twenty-sixth Annual Convention—Some Splendid Food For Thought

By Professor Arthur Bateman

BEFORE I get warmed up to speech-making I want to tell you a story. A recruiting officer tried to enlist a nigger last week in Chicago.

"No, boss," said the nigger, "I don't want to fight."

"That's all right," said the officer, "you don't have to fight.

"Just join the army and we'll put you in the first line trenches and you won't have to fight. You'll simply use your own judgment."

I had the honor and pleasure of addressing you in Springfield and Peoria, and on both occasions I pledged myself to give you a talk at any time and in any place.

Your officers have called upon me once more and here I am. I've got the floor, and although I don't have to talk, I'll use my own judgment and say a few words on a subject of paramount interest to us all.

The main plank of the National Association and almost every state association throughout the country is education, and the subject allotted me today is the "Education of the apprentice."

I have to tell you how to educate your apprentices so that they will be of greater value to you—to the public, and the fraternity to which they belong, and I am going to attack the subject without diplomacy, knowing that you will realize that it is for the good of the fraternity instead of a peace offering by a pacifist.

But wait—have you any apprentices?

I have it on the very best authority that you're all experiencing great difficulty in securing apprentices, and those you do secure are a very poor grade of young fellows whom you have both difficulty in training and holding. What's the reason for this? It's not far to seek. In the first place the prospects of becoming a plumber are not very alluring to the average boy, besides the wages offered at the outset are far from satisfactory to the young man starting out in life, who—right or wrong—thinks of the immediate future, rather than the ultimate goal.

We are passing through revolutionary times and unheard of salaries are being paid to mere boys upon whose shoulders will rest the world's work in the near future. This will become increasingly apparent the longer the war lasts, as the need of more men, and still more men, will continue to make serious inroads into the rank and file now actively engaged in keeping the wheels of industry turning.

The present situation is acute. Do you want our help or are you going to say: "I should worry. I can secure a laborer or help out and pay him $2.50 a day. I don't want to be pestered with young apprentices who are not worth a continental to me, and I certainly won't pay them $8 or more a week to teach them the business."

We are constantly up against this type of man. He looks upon the training of the apprentice as a liability and is not



PROF. A. BATEMAN.

big enough to realize that the lad is an essential factor in the ultimate efficiency of his business. He forgets the boy of to-day is the man of to-morrow, and cannot see the necessity of making an effort to make the future plumber as efficient as possible.

I tell you, gentlemen, the fraternity and association would be better off without such members.

The good men who "Builded better than they knew" had no such shallow and selfish thoughts. They did all they possibly could for you with the limited means at their disposal in those days. They had a goal to reach, and when they reached that they strove for higher ideals and higher standards, with the result those old men have handed down to us a splendid trade and profession, firmly believing that we would not only carry on the good work where they left off, but that we would throw new pep into the work and endeavor to achieve greater glory and accomplishments.

I'll tell you frankly and without hesitancy that you've got to have apprentices, and further, you've got to do everything in your power to advance them as speedily as ever their ability will permit so that they can tackle those duties and obligations that the future will undoubtedly have in store for them.

What's the use of your laborers to you? Are they interested in your work? Are they going to stick with you? Are they loyal to you? No. They are with you for what they can get out of you. They'll quit you the minute they can get another job paying two cents per hour more. Even when they are with you they are about as much use as a horse. They have to be driven, and oftentimes it takes you longer to explain to them what has to be done, and how it has to be done than if you threw off your coat, pitched in, and did the work yourself.

I tell your our present state of efficiency and prosperity has been entirely due to our apprentice system, and if in the past some things were lacking it certainly made you good practical mechanics and enabled you to make a start in business on your own accounts.

I could be hanged for what I think about Germany at this time. Yet Germany's efficiency to-day is the direct result of their apprenticeship system and technical education. They have done, and are still doing, more to increase the efficiency of their workers than any other country in the world.

England runs a close second. The British Government takes a hand in this question and fully realizes the importance and magnitude of our work. On the other side of the pond it is compulsory for a plumbing apprentice to serve six years at the trade. The boys work 9½ hours per day in the workshops and out on the jobs and then attend the technical colleges, suported by the government, three or four hours per week. In some centers they also attend two half-days as well as the evenings. This technical training is usually carried on for a period of five years. At the completion of his apprenticeship the journeyman works for under money for one year. The British Government even goes to the extent of sending a wagon through the

rural districts which both takes the boys to and from school. Surely this should make you sit up and take notice and get you started on a plan which will raise the American plumber and plumbing to a higher plane.

Do you think this colossal war will kill the plumbing business in Britain? I tell you it will not. Right now the English Local War Pensions Committees are making arrangements for partly disabled soldiers to take up work in all lines of endeavor. Those who are capable of taking up the plumbing trade will receive their training both in the workshops and technical schools. They will attend 2½ hours a day—the rest of the time being spent in the workshops and out on the jobs.

During their training a maintenance allowance will be paid by the Ministry of Pensions, while the minimum rate of wages will be 10s. for the first four weeks, 15s. from the fifth to twenty-sixth week, and 17s. 6d. from the twenty-seventh to the fifty-second week. The plumber will then be designated an improver and will serve in this capacity for another four years.

Still another reason for your securing and training apprentices at this time has doubtless received your attention. You know that Europe has been supplying us with thousands of skilled mechanics every year. But we will get no more of them either during the war or when peace is declared.

Half Europe has been blown off the map and she will want all her mechanics at home, in fact many of our valuable young men will leave for France and leave this country poorer in consequence.

I want to go on record to-day as stating that the Illinois master plumbers do want apprentices at this time and will need them in the future.

If you will agree with me on this point the next item to consider is choosing a young man that will be a credit to our time-honored fraternity, and should you find one you will have to instill into his young mind that this is a great vocation, which offers unbounded opportunities for him, provided of course that he becomes proficient in it, and that he is engaged in work in which not only the health of individuals, but of vast communities it at stake.

Further it is imperative that you pay him a reasonable wage which will not only stimulate in him a desire to work hard, but will undoubtedly attract the higher grade of youth of this country who will do his share not only to keep up the fine traditions of the fraternity, but endeavor to elevate it to heights as yet unknown.

The principals of the schools will be glad to co-operate with you and put you in touch with boys who possess the necessary qualifications to master the plumbing business, and it will be a good plan to get in touch with these boys a year or so before they leave school so that you can keep tab on them and study their characters.

If I was choosing a boy this morning I would look for one who had a sound education in, at any rate, the three R's—reading, 'riting, and 'rithmetic, which would enable him later in life to cope with the complex problems constantly arising in our scientific occupations and enable him to carry out proficiently work which may be so beneficial or detrimental to the health of the public.

He must be absolutely solid on the plumbing business. By this I mean he must realize that we are engaged in a trade and profession as honorable and important as that of law, medicine, or preaching. He must realize that the profession offers him his life's work, and that his studies and training will cease only with his life. He must possess personality, integrity, perseverance, and be enthusiastic in the work. If the latter is absent in him let him seek other fields and become what nature intended him to be, otherwise he will never be a credit to the craft and the work will in a short time become drudgery to him.

Now when you get hold of such a boy keep him and look after his interests as though he was your only son. Take my word for it, he'll repay you many times. Look after the practical end of his work and see that he gets a thorough technical and business training. Master plumbers in this country have been asleep long enough, and you've got to wake up in a hurry and follow the examples set by the largest commercial enterprises in the country if you want our trade to survive and be classed with the leading vocations of to-day. Almost every company has its welfare department which looks after the comfort, health and education of their employees, and this colossal war will develop this scheme by leaps and bounds.

You may not be in a position to open up a welfare department in your own business. It may not be large enough. But, you yourself can be a welfare man. You must remember that your employee, whether apprentice, helper, or journeyman, is your co-partner in the business. He represents you in the community, and if he does good work he will make you. If he does poor work, he will eventually break you. You must give him the best that is in you, so that he can, in turn, give your customers the best that is in him. The first instructions I received from our directors astonished me. They told me the slogan or motto of the school was "Service" and that I must serve every man as though he was my own kid brother. I have tried to the best of my ability to follow this slogan, and I find it most profitable. If you will spend a few hours with your employees and educate them up to this service you will also find that it pays you a thousand-fold.

The sooner you realize this the better. For example, the Western Union Telegraph Company, a $100,000,000 corporation, realized it was high time they did something along educational lines for their employees to insure a sufficient supply of well-trained men loyal to their company, and in the full realization that the company was doing its utmost to co-operate with them in the attempt to qualify for better and bigger work. Their problem was most difficult with forty thousand men scattered practically all over the world. They had to find a method by which the telegraph operator located at a small junction, and far away from their observation, could be given the same chance for advancement as the man located at headquarters. The only practical solution to their problem was correspondence courses. After a thorough investigation of various schools and their methods of teaching, they selected a correspondence school to help their men. They did not, however, rest on their oars—they invested literally thousands of dollars in the preparation of three separate courses, covering the three distinct lines of their business. The cost of each course represents no charge for the preparation of this work. The company has donated the same to the cause, and, furthermore, in order that no employee may be deprived of the work, where the man hasn't the money to pay the cash price, the company loans him the amount and allows him to repay it in small monthly payments.

Members of Plumbing Trade Buy Courses for Their Apprentices

I would like at this time to express my sincere thanks to Mr. Jas. A. Wood, a prominent master plumber in Toledo, Ohio. Mr. Wood not only purchased ten of our scholarships and donated them free to his employees, but put me in touch with other Toledo masters, who followed his splendid example, and in all subscribed for twenty-one scholarships. I also wish to bracket with Mr. Wood the name of Mr. Chas. W. Wilson, of Youngstown, Ohio, who, with other Youngstown masters, donated scholarships free to their employees. I also thank the masters from coast to coast who have followed that plan. They can rest assured they will receive a splendid investment on their money.

How many journeymen have you in your employ who can read blueprints, lay out, and run work?

How many can talk intelligently and convincingly with your customers?

How many can take off quantities, measure up work, and prepare accurate estimates?

How many can cope with unusual problems when they crop up?

How many would make good competitors should they open up a business on their own account?

You'll agree with me not many, and why?—simply because they've not had a technical and business training. Surely you will not admit that the plumbing and sanitary profession is for the weak-minded, uneducated, untrained men. Do you not realize that our profession needs the best brains of the country to carry out the countless, complex problems we are constantly up against? If your employees are not capable of grasping the magnitude of this work, look to it, and in the future choose only those with the necessary education and diplomacy who are fitted to carry on our great work.

Have you the time to teach the rising generation these important subjects? Will it pay you to do so? Can you do it as proficiently as the men who have made a lifelong study of teaching?

You cannot, gentlemen; it would be false economy to attempt it, but you must see that they get it now. We don't care where they get it, but get it they must. If there are any schools in your town similar to the Lane High School, Chicago, compel your apprentices and helpers to attend. If the town will open schools by all means urge them to do so. But if there are not schools, help your boys to get the necessary training by paying for a course for them, and you will find that they will take greater interest in their work from day to day.

Gas Industry and Canada's Fuel Problem

Dealing With the Great Strides That Have Been and Are Being Made in Manufacture and Furnishing of Gas for Both Home and Industrial Purposes—Its Uses Defined and Why it is More Economical to Many Industries When Every Phase of the Business is Taken Into Consideration

By Arthur Hewitt, General Manager, Consumers' Gas Company of Toronto*

(Continued from last issue.)

SOFT metal furnaces are either round or rectangular in shape, usually well insulated for economy of gas consumption, and are equipped with the burners placed to do the maximum amount of work with the minimum amount of gas. They are made with cast iron, cast steel, or pressed steel pots. These appliances range in size from 10 lbs. capacity up to as high as ten tons. The gas consumption required for melting the so-called soft metals runs about 1 cubic foot of gas for every 4 to 6 pounds of metal melted. Some of the purposes for which soft metal furnaces are used, are as follows:

Melting babbit metal, tinning, melting linotype metal, melting stereotype metal, melting type metal, melting Britannia metal, aluminum melting, spelter melting, dross melting, lead melting for casting, galvanizing, solder melting.

Crucible Furnace.—For the melting of such metals as copper, bronze, brass, aluminum, gold, silver, etc.—that is, metals which require a high temperature for melting—the crucible furnace is used. It consists of a cylinder, lined with refractory material. It is generally equipped with blast burners, which direct powerful jets of flame into the space between the lining and crucible. Crucible furnaces come in sizes ranging from the very smallest up to the size taking a No. 250 Dixon crucible. The advantages in melting the above metals with gas are that uniform results can be secured, heats can be obtained quickly, and there is very slight fire risk. Decreased labor costs, etc., tend to make gas a cheaper fuel, when total costs are considered.

Steam Boilers

Gas fired steam boilers in small sizes —say up to 12 h.p.—have proved a great success where circumstances have been favorable for their use. The type most used is very similar to the ordinary coal-fired upright fire tube boiler, the burner naturally being placed about where the bed of coal would be. While it is not pretended that with the present prices of fuel, the gas-fired boiler can compete with coal-fired boilers in large installations, yet it has proven a boon to small manufacturers requiring a small and intermittent supply of steam. Its uses are so numerous that it would be impracticable to give here a complete list, but some of them are as follows:

Heating matrix tables, heating clothes pressing machines, steaming hats, steaming umbrellas, shrinking stockings and underwear, heating steam jacketed kettles, heating rollers in various machines, heating solutions in tanks, heating shoe machines, heating coffee urns, distilling water, drying chemicals, drying blue prints and films, sterilizing milk cans, etc.

Forges, Ovens and Muffle Furnaces

A gas forge consists of a metal box, lined with refractory material, and fitted with burners so placed as to project a powerful flame directly on the work to be heated. The shapes of the forges vary greatly, being dependent on the class of work to be heated. They are also made in various sizes. Gas forges heat articles quickly, uniformly and with little scale, when properly handled.

Some of the uses for gas forges are: Annealing gold, manufacturing instruments, dressing tools, automobile repairing, rod end heating, iron bending, forging, welding, hardening, brazing, cutlery manufacturing, general machine shop work.

Annealing Furnaces are designed to heat work uniformly. To accomplish this, the burners project the flame into a chamber beneath the floor of the furnace. The flame consequently does not come into direct contact with the goods to be heated. The products of combustion, however, pass up around the inside of the furnace and escape through vent holes in the top. They are built in all reasonable sizes, and are used for a greater variety of work than possibly any other gas appliance. They are used in all the general processes of hardening, tempering, annealing and case hardening of dies, taps, milling cutters, punches and all similar tools; cutlery, springs, screws, and in fact practically all articles made from metal, and requiring heat treatment.

Muffle furnaces are constructed the same as oven furnaces, with the exception that a complete fire brick chamber, called a muffle, is contained in the furnace, preventing the products of combustion from coming into contact with the work being treated in the muffle. They are used principally by jewelry manufacturers and assayers.

Miscellaneous Small Appliances

Soldering Furnaces are small appliances designed to heat soldering irons. Usually they are arch-shaped, and frequently insulated with fire brick. Both atmospheric and blast burners are used. Consumption runs from 10 to 15 cubic feet per burner.

Blow Torches are constructed to be used with air blast and produce a flame of high temperature. They are used by thousands, for forging, brazing, soldering, bending, preheating, etc.

China Kilns are constructed on the same principles as muffle furnaces. That is, the products of combustion must be excluded from the chamber containing the work to be heated.

Machines

Corn Poppers consist of a perforated, revolving steel drum, inside of a square case, in the bottom of which is placed an atmospheric burner. By an ingenious construction of the drum the material is automatically and continually fed in, and discharged when popped.

Wafer Baking Machines are used by large biscuit companies for manufacturing sugar wafers, etc. These machines turn out thousands of wafers per day. The material is automatically fed on travelling plates, which pass over and under blast burners and then discharge the baked product.

Automatic Heating Machines.—This class includes some of the most ingenious appliances ever put on the market, for the heat treatment of metal, and other materials, in quantities. The work that may be done with them is almost unlimited, and in many cases the work can be done cheaper with gas than with any other fuel. The different styles may be used for such work as hardening mower blades, shells, pinions, balls, screws, chains, saw teeth and many other articles. They are also extensively used for annealing, tempering, brazing, coloring, etc.

Ice Cream Cone Machines.—There are in use some very cleverly designed ma-

chines for turning out that necessity of modern life, the ice cream cone.

The Use of Gas in the Manufacture of Munitions

The same causes which make gas valuable for ordinary industrial purposes apply with increased force to the manufacture of munitions. In England it is publicly admitted that the tremendous leap forward in munition manufacturing could not have been made without the use of gas. On this side of the water, while the need for gas was not vital, nevertheless gas has played an increasingly important part in munition making. At times it has been adopted solely because of the speed with which an installation could be made, but once in, it stays in, once the intrinsic merits of the fuel become known.

When munitions are mentioned, we naturally think of shells, and it is in the manufacture of shells that much of the gas used in munition works has been consumed.

In the manufacture of shrapnel every shell has to be hardened and tempered in a manner similar to the treatment of tool steel. The end of the shell must also be heated in order to forge in the end, or "nose" it. Much gas has been used for this purpose, and also for heating water used for washing grease off the finished shell, and for melting rosin which is poured into the shell after it has been charged with bullets. Even the high explosive shells have required gas. It has been used in ovens for baking varnish on the inside of the shell, and in some sizes, notably the six-inch, large quantities have been used in forges for "nosing in."

Comparatively large gas-fired annealing furnaces have been employed for the treatment of various parts of shells, rifles, etc. Many parts are heated in forges for various operations, some of these forges being even 25 or 30 feet high, which shows that gas is being worked into the heavier operations.

Continuity of Gas Supply in Toronto

Although large quantities of gas have been used for the purposes to which I have referred, it is not contended that other fuels could not be used, but nevertheless for various reasons gas has been preferred. In the manufacture of small cartridge cases, however, gas is almost a necessity, and to the best of our knowledge is the only fuel used in the intricate machines which turn out millions of small cases, every one of which must be treated with absolute uniformity.

Gas was first supplied in Toronto on the 28th of December, 1841, and from careful investigation it would appear that, while there have been local stoppages due to frost, broken mains, etc., there has not been even a momentary interruption to the general gas supply to the city since that date, a period of more than seventy-six years.

Conclusion

I shall have failed in the purpose of this paper if I do not state definitely my conviction that each class of fuel available for consumption in Canada should be selected and appropriated for the purposes for which it is inherently and economically best suited, regard being had to the essential objectives of:

1. Limiting the necessity for importing fuel from other countries.

2. Limiting as far as possible the use of high-grade gas coal to the purposes for which the largest percentage of its efficiency can be usefully employed.

3. Avoiding the use of fuel requiring a long haul wherever it is possible to secure a suitable substitute requiring only a short haul.

How to Sell Stationary Vacuum Cleaners

Some Reasons Why the Trade Should Increase Their Business by Selling Stationary Machines—How to Sell and Why—Extract From an Article by a Late Master Salesman

By One of Us

THERE are thousands of men who, in some way or other, appear to think that to save money one must not buy anything with it. They think that saving money means hoarding it. They think that to eat less, to live in less sanitary homes, and to skimp on the size of heating boilers and radiation, means a saving of money. They might just as well go one further while they are at it, and declare that they should not go to work, because in so doing they will wear out their shoes, or they might as well stop the clock to save time.

The fact of the matter is that to save money may mean spending more. For example, a man may, in pre-war days, buy as many as four cheap or lower-priced suits of clothes a year, costing him $10 per suit; but it would have been much more economic if he had paid $15 per suit and only bought two.

With regard to heating systems, small furnaces and short radiation in our homes are causing a wastage of several hundred thousands of tons of coal, and every other item of expense in connection with the haulage, importing and general transportation expenditures that is involved in this waste of fuel.

Then there is the expense involved in time taken to attend to such furnaces—the dust and dirt, etc., and this brings us to other items of labor in the home.

If every home had a stationary vacuum cleaner installed therein what saving could there be made?

How many hours a day has the housewife to spend sweeping and dusting with a broom? The broom, that most insanitary abomination, a thing that merely acts as a churn, that stirs up more dust than it really removes. And not only is the broom an insanitary appliance, but it is a very laborious article to wield. Many an aching back and tired limbs has been caused by using a broom.

The following is an extract from a pamphlet written by the late Elbert Hubbard, one of America's greatest salesmen and writers. He not only helped to sell stationary cleaners, but he sold himself and helped many a man to sell himself just at about the time when that man had nearly lost faith in himself.

Elbert Hubbard and his wife, Alice Hubbard, were victims of the Kaiser, and the pamphlet referred to was written the year before the war broke out. It is entitled "The Kingdom of Dust," and contains some splendid selling talk.

Extract From the "The Kingdom of Dust"

On our Pullman, the other day, was a coon doing extra, dead-heading home. He was ashy-yellow in hue, sad and utramarine, immersed in gloom. I sought to disentangle him from his melancholy.

"Us is dyin' off fast," he remarked.

And then he explained that he had been up to Saint Paul to attend the funeral of his partner, who had died of tuberculosis.

"It's the dust in these yere kyars," he said.

And I said nothing, because there was nothing to say.

Dust is not only the bane of the palace car, but it is the bane of palace, cottage and tenement alike.

To relieve the house of dust is to add to the length of days of its occupants.

I have been reading a remarkable little book, entitled, "The Kingdom of Dust," by Dr. J. Gordon Ogden, an eminent professor of physics and chemistry.

The kingdom of dust is the kingdom of death.

In this book Dr. Ogden says, "Dust is the right hand of death."

Dr. Ogden then goes on to say, "More than half of all deaths in the world, from the Equator to the Poles, are due to the distribution and breathing in of dust."

Dust carries with it the germs of dis-

solution, bacteria. Bacteria exist in all dust where human beings live, eat, sleep, move, work. Wherever we go we are throwing off particles of animal matter.

This dead animal matter contains bacteria. Bacteria are a form of vegetation, so small, so minute, that fifty thousand of these germs may sit on the edge of a knife-blade along a line one inch in length.

Some are visible under the microscope. Others are so minute that the highest power of the microscope fails to find them. We only know that they exist by watching their growth. They come out of the unseen and evolve until the microscope can detect them.

Bacteria are divided into three clases: the spherical, or cocci; the rod-shaped, or bacilli; and the spiral.

These grow by fission. That is, they divide, and a piece so small that it can not be seen by the microscope, sometimes breaks off and can be caught by the scientist on a "petri plate" or culture-bed, and evolved.

Bacteria are mostly of a septic order, and these are the cause of various diseases. The best examples of septic diseases are pneumonia, tuberculosis, and such contagious diseases as diphtheria, scarlet fever, measles.

Dr. Ogden maintains that the diseases caused by bacteria are avoidable. The thing to do is to minimize dust.

Dust is everywhere, but the worst kind of dust is that which is confined within the four walls of a room. This dust is always germ-laden, because it is infested with effete matter thrown off by human bodies.

In the Boston City Hospital, where the most rigid possible sanitary conditions prevail, living bacteria are found to be 1,350 to the cubic foot of air. In Central Park, New York, bacteria are found to the extent of 1,500 every cubic foot.

These conditions are not especially unfavorable to life. But when you get up to 20,000 living germs to the cubic foot you are getting into danger, and this often happens in homes that are not properly swept and cleansed.

The average house, where the rooms are only fairly ventilated and the housekeeping is indifferent, may have from 10,000 to 15,000 bacteria to the cubic foot. If we would be well, we must devise a plan by which the bacteria are not simply scattered through the room by sweeping and dusting, but by which they are picked up effectively, captured and destroyed.

This is where the sanitary vacuum sweeper is an absolute necessity in preserving health, sanity, happiness and efficiency.

The Passing of the Broom

Lung diseases, especially pneumonia and tuberculosis, are increasing as population grows more dense. The great white plague goes hand in hand with civilization. The chief cause of lung disease is dust.

All occupations that render it necessary for the operators to breathe in dust have now come to be regarded as hazardous, and as such are frequently the subject of special legislation by our law-makers.

With the broom, woman fights dirt, dust and her enemies, including man.

Sweeping with a broom is a most unsanitary operation. It starts an agitation of circumambient microbes, and causes a circulation of the microbes. After sweeping, the housewife has to go over the furniture with a cloth by hand. Some of this dust is taken up on the cloth, but most of it is simply rubbed off and again chased through the air, and much of it milady breathes.

So it is a transfer of dust and dirt from one place to another.

Necessarily, a considerable quantity of this dust is inhaled by the occupants of the room.

The Toll of Civilization

An eminent physician and surgeon of Minnesota—a man of world-wide fame—has recently said: "More women patents, three to one, are sent to hospitals than men. This comes, in large degree, from the fact that women live indoors and breathe a dust-laden, second-hand atmosphere which depletes their vitality."

All life is a fight between the opposing forces of life and dissolution.

Happily, there are millions of germs in every human body that are fighting for health, and when these health-germs are in the ascendant we are well.

But whenever the malevolent germs, or germs of disease, outnumber the germs of health, we decline, grow weary, tired, get sick and die. The thing is to preserve resiliency—and resiliency is resisting power.

Dr. Weir Mitchell, one of the most eminent physicians in the world, has recently said: "What we call diseases are only symptoms of conditions. Allow the man's vitality to be reduced to a certain point, and he is ripe then for any of these weaknesses, or certain conditions, which we call disease."

Disease is an endeavor on the part of the malevolent germs to force the man into bankruptcy.

They have appointed themselves receivers, and are foreclosing on the claim.

Man is an air-breathing animal. He begins to breathe the moment he is born; and when he ceases to breathe for four minutes he is dead; the spirit takes its flight, and the body returns to the elements from which it was formed.

The integrity of the body is maintained only so long as the blood is oxygenated through the breath. The air we exhale is laden with carbonic acid gas—a virulent poison.

All things in the world have three forms: these are gaseous, liquid and solid. Everything is moving from one of these forms into another.

For instance, the sputum is a liquid. Dried in the open air, it soon becomes a solid. Then, pulverized, it is taken up by the air and circulates in minute dust particles, some of which are too small to be seen.

Air, out of doors, in motion is in a state of purification. Only running water is pure.

Where the winds blow and the waters run you will find health. Activity is the one great secret of life. Everything is in motion. Movement is eternal. There is nothing permanent, but change.

Air inside of a house is pretty nearly static. In the enclosed walls the air is caught and held, and we breathe it over and over.

Well does Seton Thompson say that half of our diseases are in our heads and half are in our houses.

In winter we have double windows and storm-doors, and these are nearly as bad for shutting out fresh air as the old-time custom on the farms of banking the house with manure, chinking the front door and nailing it tight, and putting strips of cloth in all crevices of the window-frames, fastening them close until spring-time came.

Such conditions made the family physician a necessity. Mumps, measles, whooping-cough, typhoid, ague, chills, intermittent fever, pneumonia, sciatica, rheumatism, granulated eyelids, colds and a lot of other cheerful things follow as a natural result.

(Continued in next issue.)

THE OLD WAY AND THE EMPIRE

It is very encouraging to note that manufacturers and jobbers are at last devoting more time to cultivating new business with the rural resident. They are spending money on all manner of literature, compiling and revising catalogues and books in an endeavor to assist the trade to better and more easily procurable business from the farmers in particular.

Pumping appliances have been remodelled, improved and made more efficient, all with a view to increasing the service they are expected to give to the farmer, and these improvements, at least many of them, are described in a new book just off the press entitled, "The Old Way and the Empire Way."

This book is well gotten up, and is being issued to the trade by the Empire Mfg. Co., London, Ontario. It contains some valuable information regarding pneumatic water systems, all kinds of pumps and sewage disposal systems. Every member of the trade may be the possessor of this book by applying to the above address.

NEW CATALOGUE

The Pease Foundry Co., Toronto, have just issued a very attractive and useful catalogue and price list describing their full line of furnaces, warm air, hot water, and steam, as well as a full line of registers, fittings, radiators, and other accessories used in connection with the heating trade. It also contains some very valuable and up-to-the-minute information for the heating engineer. It is pocket size and contains over 150 pages. Those who desire to procure one of these books can do so by dropping a postal to the King Street East office, Toronto.

Gas Appliances a Big Source of Revenue

Shortage of Coal Increases the Prospects for the Sale of Gas Appliances — Boiling Water on the Gas Stove a Costly Method—Hot Water on Tap 24 Hours a Day is a Necessity in Almost Every Home

THE advent of warm weather has for many years been taken as a sign that the proper time to sell gas water heaters had arrived. Gas companies, gas water heater manufacsurers, and the trade, all have the opinion, which of course is based upon previous experience, that the coming of spring brings with it the best and most opportune time to sell such appliances.

Now, there is no logical reason that we can see why gas water heaters, etc., should not be a source of revenue the whole year round.

Last winter the writer called upon a friend of his and found that the furnace in his friend's home was not giving off sufficient heat; that a domestic coil was installed, and that there was at times a surplus of hot water at the range boiler. Every time the cold water was turned on the range boiler took a dance round the furnace almost, and made a noise almost as if a bunch of boys set off a dozen packets of Chinese crackers.

Upon being asked the reason for the noise, also whether the furnace, which was a warm air furnace, could be made to give off more heat, etc., the writer advised as follows:

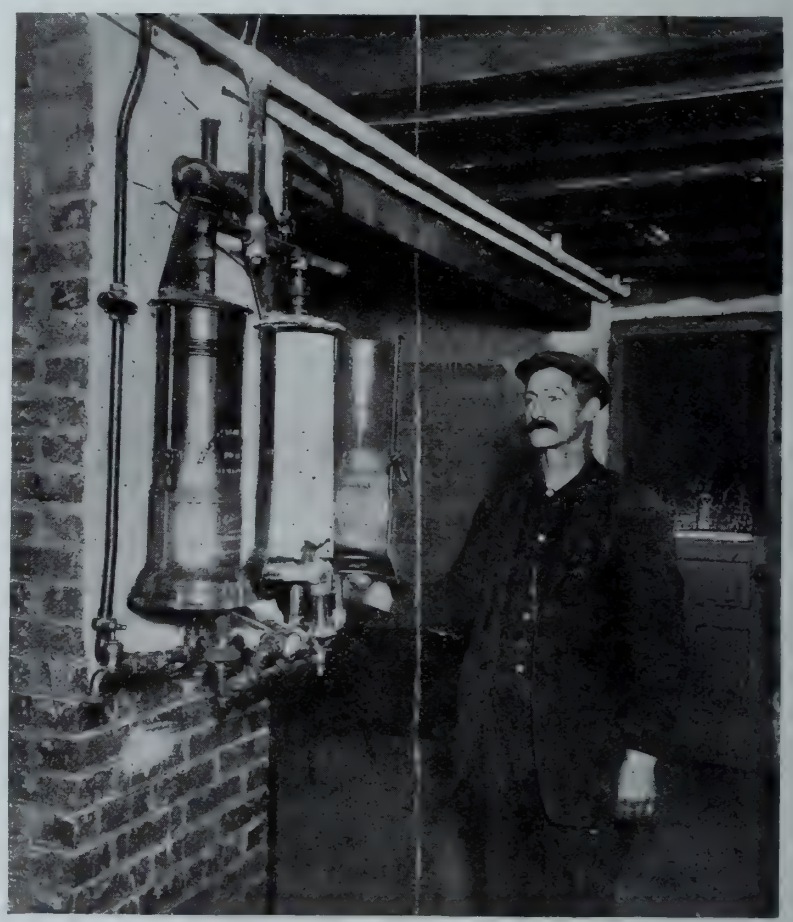
"Take out the coil which is in the furnace, instal a good gas water heater and hitch a 36-foot wall radiator in the dining room; close the dining room warm air register, and you will be increasing your heating plant, and will also have hot water for domestic purposes all the year round, and plenty of it." This job cost $60 complete. A gas water heater was sold in the middle of the winter, the furnace fire was never out, simply dampened down with ashes until the coil was taken out. Not that we would advise that such a job should be left until the winter time arrived, but there is business to be procured by selling gas water heaters at other times than in the spring. This same man who had the change made would likely never have bought a gas water heater if the question had not been put to him in the way it was, for the simple reason that for two or three months he goes to a summer cottage to live, and furthermore, he is about in line for buying an oil heater to connect with his range boiler at his summer cottage.

Now there are a number of good points in connection with this incident that is of importance to every member in the trade. First, that gas water heaters can be sold at other seasons of the year than in spring; secondly, a gas water heater can be installed where a booster or assistance is required to increase the heating of a home at real cold spells. By the way, this friend of the writer's told him the other day that his furnace had been out three weeks, and that the gas water heater kept the chill off the house, whereas his neighbors are still burning coal, and have a hard time keeping the fires low enough for fear of being roasted out.

So there is another point in favor of a gas auxiliary heating system.

Thirdly, that not only was there the sale of a gas water heater made, but also a 4 x 9 section wall radiator, a couple of valves, fittings and pipe, and a job when jobs were scarce.

Then there are districts where natural gas is used and where batteries of gas water heaters can be built up and installed for heating the whole house by gas, using hot water. The accompanying picture shows where a heating engineer in Altoona, Pennsylvania, fitted two gas water heaters to the heating system in his own home.



The house consisted of six rooms and bathroom, 300 square feet of hot water radiation, and he reports that the job works splendidly; the heaters are using natural gas, and the cost is reported as at about 40 cents per thousand square feet, these two heaters only consuming about 500 cubic feet of gas per 24 hours.

One point of very great importance in connection with gas water heater service is that the construction of high-class gas water heaters makes them the most efficient per heat unit of any form of gas heating, or even coal, simply because the coils or other heating surfaces are so constructed as to absorb the largest number of heat units to be gotten out of gas.

The first case mentioned where the addition to the warm air system was made, a No. 25 25-foot copper coil heater was installed and artificial gas was consumed, whereas the last-named installation referred to a one-piece spiral iron heating element and natural gas was used. So it will readily be seen that there is a big source of revenue in selling gas water heaters all the year round, and for more purposes than merely giving domestic hot water service.

Another idea that prevails in the minds of many housewives is that water heated with a gas water heater is not fit for cooking or human consumption. To

a certain extent that is true; but there are conditions which prevail where it would be quite safe and sanitary to use water heated by such appliances for the purpose named. For example, if an instantaneous heater is in operation, and water was wanted in a hurry, filling the kettle from such an appliance would be perfectly in order. But where water had been heated and reheated, or where water was being used as in the cases just named for the partial heating of a home through hot water radiators, it would not be advised. It will, however, be seen that there are quite a lot of uses which the hot water can be used for, even for cooking purposes, once the matter is explained clearly to the average person.

In connection with the sale of gas water heating appliances, we are informed that manufacturers have drawn up elaborate plans by way of conducting selling campaigns in an endeavor to assist every member of the trade to make sales in their district. We are not quite clear about every individual plan, but have learned that if a member of the trade sends in a list of his customers or persons whom he knows can afford to instal a gas appliance to the manufacturer that this manufacturer will circularize, send letters and follow-up matter. Have a number of posters placed on billposting stations in the district, and then write the sanitary engineer who sent in the list, informing him of results, sales, etc. No doubt the manufacturers of gas water heating appliances are becoming more and more convinced that the sanitary and heating trade is the most logical channel through which gas water heating appliances should be sold, and they are out to do all in their power to assist the trade all they can.

Pure Water Supplies for Farmers

The Ontario Department of Agriculture to Assist Farmers to Procure Pure Water Supplies—Also to Advise How to Protect Same From Impurities—Will Also Prepare Drawings and Advise Type of Water Systems Suitable For Various Conditions, Etc.

THE farmer at last is to be shown that there is such a thing as rural sanitation. He is going to be told that cesspools are insanitary; he is going to be shown that sanitary appliances on the farm are just as necessary as the reaper and binder. And his wife is going to be a wife in deed as well as in need.

The farmer is going to be shown how to get pure water and how to keep it pure; and we sincerely hope he is going to be told that it is against the law to pollute "lakes, rivers, streams and navigable waterways."

There are too many farm papers published that advise or else describe all manner of cheap and insanitary water supplies and so-called sewage disposal plants. The following is a specimen of what the farmer is being fed up on in his own journals, and it's a pity. The extract was taken from an article which described how certain communities solved the problem of bathroom outfits and sewage disposal system, and under the heading of "Sewage Disposal Solved," said:

The sewage disposal in this particular home was easily solved. A small, swift creek runs through the fields at the foot of the hill just back of the house. A tile was laid from the house to the creek, and the limited sewage in this way thus disposed of satisfactorily without trouble.

For sewage disposal most of the homes which we visited rely on the septic tank, which is entirely sanitary. This is a tank of two compartments built underground, and usually built with cement walls and bottom, although if well plastered inside, brick may be used.

The waste from the house enters the first compartment, from which, by means of a syphon, it automatically enters the second compartment, and from there is carried underground to a nearby field by means of several drains of four-inch tile, branching off in different directions.

So our readers will agree with us that if the Provincial Government will only advise and instruct in a proper manner just how sewage should be disposed of, and how a water supply can be procured and kept pure, it will do much towards making every farm home a real home.

The following is a clipping from one our daily newspapers, from which it appears that something is going to be done:

Provincial Government Would Improve Water Used for Stock

"After an investigation extending over several weeks the Ontario Department of Agriculture has decided to enter upon an educational campaign to have the water service on the farms improved. During the investigation it was brought out that a big majority of farmers in this province are using well water that is decidedly impure, and in some instances it is seriously contaminated. In the hope of persuading the farmers to take steps to correct this condition of affairs, the department will shortly issue a booklet covering every phase of the water and sanitation problem on the farms.

"Provision will be made in connection with this booklet to make available to the farmers the knowledge of the Ontario Agricultural College experts. Water will be tested upon requests, and on application being made working drawings will be supplied for water systems. The department also stands ready to help the farmers to locate a new water supply. At the O.A.C. now there is a new electrical water finding mechanism. It has given excellent results in India and New Zealand, but it has yet to be tried out in Ontario. It is stated by Prof. Day, who secured the tester, that the machine located water in India in 27 tests without one failure, and that in a district with little water. This tester will be available for any farmer who applies for it to assist him in securing a new supply of water."—"Globe."

Now what does such a move mean to the sanitary and heating engineering profession? It means that there is going to be a greater demand for plumbing fixtures, bathrooms and pneumatic water systems. It means that septic tanks will be installed to receive the sewage, and that disposal field tile will have to be laid, and that the day of the cesspool is gone. It means that sanitary engineers will call upon farmers and show how a water system will help the housewife do even more work than she now is doing with less labor cost, or else accomplish the same daily task with less physical and mental effort.

No one can paint such pictures of comfort and convenience as can the sanitary and heating engineer. So, viewing the matter as we do, we can only conclude that it's up to the craft to get in and under the job. Show the farmer all these possible accomplishments that can be brought into being by acquiring sanitary bathrooms and hot and cold water at the tap all the year round.

To manufacturers of plumbing goods we believe that salesmen should be given country territories to work on, and if not actually booking orders these salesmen should be doing some missionary work among the shops in small towns or by calling on farmers with catalogues and approximate prices. We really believe that if a few good live salesmen were to go to their plumber customers with a proposition such as calling on a farmer with him and let the plumber hear the salesman discuss the selling of a bathroom outfit that much good would result. There are too many of us prone to think that to "have to be shown" is an admission of weakness or incapacity." Nothing of the kind. But it is pure, unadulterated ignorance to pretend to "know it all," and we regret to state that there are far too many of this latter class in most all business.

One thing sure, the farmer and rural resident are going to procure city conveniences, and it seems to be the plain duty of every sanitary and heating engineer to get right after the farmer for this business, which in a nutshell is health insurance.

SANITARY ENGINEER

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VOL. XII. MAY 15, 1918 No. 10

YOU CAN HELP THE GOOD WORK

THE movement which is now under way having for its object the task of proving to the public that sanitary engineers of standing are men of integrity and second to none in their desire to give good service will, if persistently followed out, undoubtedly succeed in raising the craft in the estimation of the public.

To achieve this end, however, it must receive the enthusiastic support of every worthy member of the sanitary profession. Each one should put the question to himself, "Now how can I help to promote the success of this idea?" It will not help matters to look on and say "Oh! yes, that's a very good idea, I hope those fellows will carry it out." Your help, Mr. Reader, is required to make the thing a success.

"Well," you may say, "tell me how I can help!" Here is the answer to that. "Sit down now and write a letter either to the Secretary of the Toronto D.S. & H.E. or to the editor of this journal. All you need say is that you have read of this movement in SANITARY ENGINEER and heartily approve of it and will do what you can to help it. If you do no more than that, that in itself will be something. It will encourage and hearten those who have taken the matter in hand, it will make them feel that the time they are giving in your service (for it is in your service as well as in their own they are doing it) is not wasted and that their efforts are not unappreciated.

If you can offer any suggestions or if you have any criticism to make on what you have read, by all means let us have it, but in any case let us have the moral support of your expressed approval.

A SPLENDID MOVEMENT

AN another page there appears an article which tells of a movement which is being carried on by the Ontario Department of Agriculture with a view of showing farmers and rural residents the importance of rural sanitation, and the need of an abundant pure water supply. Every sanitary engineer knows full well that no dwelling could really be classified as being fit for human habitation which is not fitted up with water and sanitary equipment such as is found in the average city home. Yet in spite of this, we do not find that the trade as a whole are responding to the call of necessity from rural districts which farmers are really making.

Every farmer needs such appliances as are installed by members of our profession, but the average member does not realize as he should and would if shown that a fully equipped home is just as necessary and more so than the implements the farmer uses in the field.

But somehow or other, as we stated before, the trade has not yet appeared to respond to the call of necessity. Of course if the cave man had never gone beyond the hole he lived in or the creek he drank from, etc., he would still have been a cave man and so would we all have been too. But the cave man wandered and wondered, the spark of progress was set afire by some one and we want some one evidently to awaken the spark in our members. Nearly four years has SANITARY ENGINEER been telling its readers of the green fields far away, where agricultural implement men were doing big business, etc., and a few members of the trade took heed and to-day are doing a nice business in rural districts. One reader told us nearly four years ago that he took the advice of SANITARY ENGINEER, went after the farmer, and in less than four months' time he had sold and installed eleven pneumatic water systems, along with from $100 to $800 worth of plumbing and heating appliances to each job, and to-day he is one of the biggest buyers of pneumatic water systems in Canada.

Let us ask our readers if they can recall any business in the world that has prospered more than the agricultural implement industry, with one exception, that of the automobile industry, and it would be almost safe to assert that the farmer has spent of recent years far more on even automobiles than he has on bathroom, kitchen, laundry and other sanitary appliances.

And now we find that the Ontario Government is awakening to the fact that sanitary appliances, pure water and sanitary sewage disposal systems are a necessity. The least that the trade can do is to respond, come out into the open and plan to get this business which is really being prepared for them.

EDITORIAL BRIEFS

CANADA'S annual fire loss reaches stupendous figures. The majority of fires are due to preventable carelessness. Protection against fire is a national duty and every individual can take an active part in conserving national wealth.

How to Secure the Public's Good Will

Form of Advertisement Suggested—Matter Discussed by Members of Craft — Further Suggestion Made by Members to Add Independent Members to Investigation Committee—Suggestions Invited

By C. J. Morris

IN our previous articles we arrived at the conclusion that it was principally owing to the inefficient work of incompetent men posing as fully qualified plumbers that the craft had fallen into disrepute with the public, and the suggestion was made that by means of advertisement all reputable members of the craft should collectively make known to their fellow citizens their desire to give every customer a square deal and their willingness to submit to investigation any dispute or any complaint for which a customer might consider there was a just cause.

Since the first article of this series appeared in SANITARY ENGINEER, the matter has been discussed by members of the craft themselves as the meeting of the Toronto Association of D. S. & H. E., and it has been decided to make enquiries as to the cost and to take other steps with a view to instituting an advertising campaign on the lines above mentioned.

EDITOR'S NOTE

SANITARY ENGINEER has felt so strongly the necessity of combating the antagonistic feeling which seems to be everywhere so prevalent as regards our craft that it decided to obtain an independent opinion as to the best means to eradicate this feeling and secure the good will of the public. Two articles have already appeared in which was advocated an advertising campaign with a view to impressing upon the public the fact that the craft are desirous of securing their good will. The present article deals with the form such an advertisement should take.

In connection with the proposal offering to submit any complaint to a committee formed from among the members themselves, it was further suggested that the complainant should be requested to appoint as his own representative on that committee a member of the public unconnected with the trade.

The suggestion is an excellent one and goes to show the genuine desire which permeates those who are taking the matter in hand to leave no stone unturned in their effort to convince the public generally of the sincerity of their professions. While the inclusion of an independent or third party on such a committee could not fail to afford satisfaction to the complainant, it would render the task of adjudication more easy in that it is far less difficult to make explanations to and convince one unconnected with a dispute than one of the principals. Any decision, moreover, at which the committee might arrive as to settlement would carry far more weight and be much more likely to be accepted as final by a complainant were a friend of his own a party to it than a similar decision given by a committee consisting only of members of the craft.

We have now to consider the actual form of advertisement which it would be desirable to insert. That shown on this page is intended merely as a suggestion and could probably be improved upon. Suggestions to this end are invited and will be cordially welcomed.

As the list of members increases and becomes too large for insertion in the advertisement itself a change can be made in the advertisement and the public can be invited to send for the list containing the names of those sanitary engineers who are working in connection with the scheme.

OUT TO GIVE A SQUARE DEAL

IT has always been taken for granted that when you saw a "plumber" on the street that he was either going to rob some one or was just leaving some one he had robbed. Public officials, crown attorneys, judges, lawyers, parsons and newspaper editors all alike have jibed and joked since time was at the expense of the "plumber." And the plumber, well, he has resented these jibes in as many ways as he could conceive. He has tried to give a square deal, but no matter what he did he could never be honest. However, the tide has turned, the plumber is, in fact, a non-existent in a sense. The plumber was at one time a worker in lead, to-day he is more, he is an engineer, if he is competent to do the work which these days of progress demand of him. He must study physics, hydraulics, metallurgy, chemistry, civil engineering and biology. So that it is easily seen that the plumber is no more. He is from now on a sanitary engineer, and he is out to give a square deal, and expects same in exchange from those whom he serves.

LIST OF NAMES

Above is a list of names and addresses of those who have banded together to serve the public faithfully. They will engage the best men they can procure, and will use the most reliable material, best suited for the purpose. They desire to have the public to report to the committee whose names are starred, or the undersigned secretary of the association, any grievance, any dispute, that may arise in connection with any work done, material used or amounts charged.

Any person having such a grievance may choose any outside individual to act with the above committee in an endeavor to settle each and every dispute in an amicable and satisfactory manner—all with a view of creating in the minds of the public that there are men in the sanitary and heating business that are out to clear the air of the bad feeling which exists between their profession and the public.

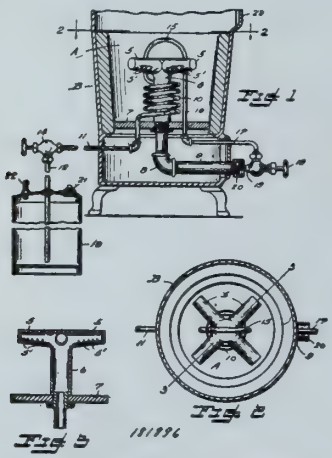
New Canadian Patents

No. 181,896.

John F. Smith, Seattle, Washington, U.S.A., 29th January, 1918; 6 years. Filed 27th December, 1917. Receipt No. 289,101.

Claim.—1. In apparatus of the class described, the combination with a burner having a head formed with a plurality of hollow arms having orifices in their under sides, a subjacent mixing chamber, and a hollow post connecting the latter with said head, of a tubular vaporizing coil surrounding said post, a connection for the supply of fuel oil under pressure to the lower end of said coil, an outlet connection for the gas from the upper end of said coil, and a needle valve provided on the discharge end of said outlet connection and arranged to deliver gas into the aforesaid mixing chamber.

2. In apparatus of the class described, the combination with a burner having a



No. 181,896. Oil Burner.

head formed with a plurality of hollow arms having orifices in their under sides, a subjacent mixing chamber, and a hollow post connecting the latter with said head, of a tubular vaporizing coil surrounding said post, a connection for the supply of fuel oil under pressure to the lower end of said coil, an outlet connection for gas from the upper end of said coil, said outlet connection being extended above the burner head to serve as a gas superheater, and a needle valve provided on the discharge end of said outlet connection and arranged to deliver gas into the aforesaid mixing chamber.

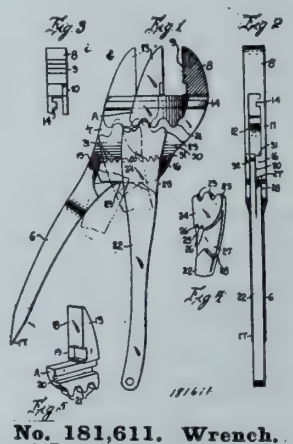
3. In apparatus of the class described, the combination with a burner having a head provided with discharge orifies in its under side, an upright hollow post supporting said head, and a horizontal pipe affording a mixing chamber and connected to the lower end of said post, of an oil vaporizing coil surrounding said post below said head, means to supply oil under pressure into the lower end of the coil, an outlet connection from the upper end of said coil, a valve provided on the discharge nozzle in axial alignment with and at a distance in front of the end of said pipe, and adjustable means provided on the latter to serve as an extension thereof for regulating the length of the effective gap through which air is admitted into the pipe.

4. A gas burner having an upright tubular post, a head provided with a plurality of arms provided on the upper end of said post, said arms being provided on the upper end of said post, said arms being provided with orifices in their under sides, a gas and air mixing pipe connected to the lower end of said post, an oil vaporizing coil provided with said head, means to supply oil under pressure to said coil, and manually regulated means to discharge the gas generated in said coil into said pipe.

No. 181,800.

Ferdinand A. Henschell and Albert H. Dixon, co-inventors, Hay Lakes, Alberta, Canada, 29th January, 1918; 6 years. Filed 13th April, 1917. Receipt No. 278,368.

Claim.—A wrench comprising a handle member having a fixed jaw, a movable jaw of less length than the handle member pivotally connected therewith, and a set screw threaded through the inner end of the movable jaw and having a capstan head for the purpose specified, and a spring normally forcing the jaws apart, said movable jaw being pivotally



No. 181,611. Wrench.

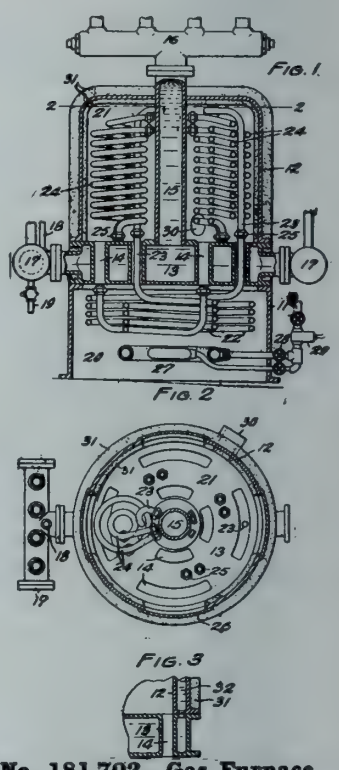
connected to the fixed jaw by means of bearing plates on opposite sides of the jaws, and a spring being arranged between the bearing plates.

No. 181,709.

David Kasanof, Hamilton, Ontario, Canada, 22nd January, 1918; 6 years. Filed 6th December, 1917. Receipt No. 288,398.

Claim.—1. A siphon comprising the ordinary inlet and outlet arms, and a supplemental tube extending from a point in proximity to the bottom of the inlet arm to a point intermediate of the length of the inlet arm with which it communicates, the area at the inlet to the supplemental arm being less than the area at the bottom of the inlet arm.

2. A siphon comprising the ordinary inlet and outlet arms, and a supplemental tube extending from a point in proximity to the bottom of the inlet arm to a point intermediate of the length of the inlet arm with which it communicates, the area at the inlet to the supplemental arm being less than the area at the bottom of the inlet arm, and the cross sectional area of the supplemental arm being greater than the inlet arm.



No. 181,702. Gas Furnace.

No. 181,702.

William J. Graham, Montreal, Quebec, Canada, 22nd January, 1918; 6 years. Filed 25th October, 1917. Receipt No. 286,796.

Claim.—1. In a furnace of the class described, a casing, a water section therein dividing the casing into a burner compartment and an absorption compartment, flues through the water section connecting the compartments, and a series of water coils located in the absorption compartment.

2. In a furnace of the class described, a casing, a water section therein, separating the casing into a burner compartment and an absorption compartment, flues through the water section connect-

ing the compartments, a warm water outlet for said section, and a series of coils in the absorption compartment connected at their lower ends with the water section, and at their upper ends to the outlet thereof.

3. In a furnace of the class described, a water section forming a receiver for return water, a series of heating coils connected at one end to said water receiver, and a hot water discharge connected to the opposite ends of said coils and to the receiver, and a heat confining casing enclosing the coils.

4. In a furnace of the class described, a casing divided into upper and lower compartments by a cool water receiver, a hot water riser, and coils in the upper and lower compartments connected at their lower ends to the receiver and at their upper ends to a common hot water riser.

5. In a furnace of the class described, a cool water receiver, a hot water riser, a series of coils connected at their lower ends to the receiver and at their upper ends to the riser, and a jacketed casing enclosing the coils.

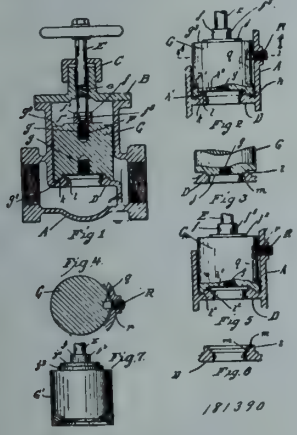
6. In a furnace of the class described, a cool water receiver, a hot water riser, a series of coils connected at their lower ends to the receiver and at their upper ends to the riser, a casing enclosing said coils, and inner and outer coverings of insulating material for said casing.

7. In a furnace of the class described, a casing, a cool water receiver dividing the casing into lower and upper compartments, flues through the receiver bringing the compartments into communication, a hot water riser connected to the receiver, coils in the lower and upper compartments connected at their lower ends to the receiver and at their upper ends to the riser, the coils in the lower compartment being continued through the flues into the upper compartment.

No. 181,390.

Emanuel Fisher, Providence, Rhode Island, U.S.A., 1st January, 1918; 6 years. Filed 14th November, 1917. Receipt No. 287,628.

Claim.—1. In a device of the type set forth, the combination of a valve seat



No. 181,390. Valve.

comprising a series of concentric external steps, and a cylindrical valve comprising a flat operating end face provided integrally with a series of concentric cavities adapted to severally embrace the steps with the concentric faces of said steps and cavities in engagement with each other.

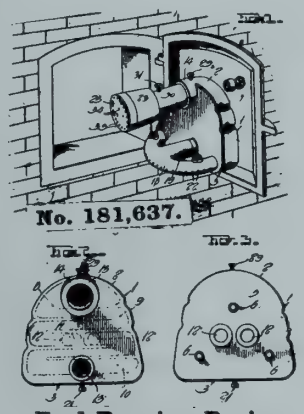
2. In a device of the type set forth, the combination of a valve seat comprising a plurality of concentric internal steps, a cylindrical valve provided with an operating end face, and integral concentric steps upon said face adapted to register with the first-mentioned steps with the concentric faces of the steps of said valve and seat in contact with each other.

3. In a device of the type set forth, the combination of a valve seat comprising concentric external and internal steps, a reversible cylindrical valve comprising integral flat operating end faces, one of said faces being provided with cavities adapted to embrace the external steps, and a step on the other face adapted to register with one of the internal steps.

No. 181,637.

Leonidas Doty West, Denver, Colorado, U.S.A., 15th January, 1918; 6 years. Filed 5th October, 1917. Receipt No. 286,034.

Claim.—1. A fuel saver and smoke consumer comprising a plurality of pas-



Fuel Burning Device.

sages for simultaneously supplying hot air at different temperatures to a combustion chamber of a stove or furnace, means at the outlet for the air of one temperature for spraying said air into said chamber, and means at the outlet for the air of the other temperature for superheating the latter and spraying it into said combustion chamber.

2. A fuel saver and smoke consumer comprising a casing having an open end and having in its other end an opening, and a perforated tubular neck extending from said cover through said casing and opening.

3. A fuel saver and smoke consumer comprising a fluid heating body located above the fuel containing portion of a firebox and having the heat and flames of said firebox as its sole heating means, said body having a plurality of non-communicating passages for supplying fluid at different temperatures to the firebox, the inlets of said passages being seperate from each other and the outlets thereof being vertically spaced for discharging the fluid at different elevations.

4. A fuel saver and smoke consumer comprising a fluid heating body located above the fuel containing portion of a firebox and having the heat and flames of said firebox as its sole heating means, said body having a plurality of non-communicating passages of different lengths for supplying fluid at different temperatures to the firebox, the inlets of said passages being separate for each other and the outlets thereof being vertically spaced, whereby two currents of air at different temperatures and at different elevations will be discharged into the firebox.

5. A fuel saver and smoke consumer comprising a hollow substantially flat metal body disposed vertically and having in one flat side a pair of horizontally spaced fluid inlet openings, the other flat side of said body having a fluid inlet in each of its upper and lower ends, and an upper and a lower series of horizontal staggered partitions in said body above and below said inlets, the lowermost of said upper series and the uppermost of said lower series being connected by a short vertical partition located between said inlet openings, whereby two zigzag fluid heating passages are provided leading from said inlet openings to said outlet openings, said passages being of different lengths for supplying heated fluid at different temperatures.

CONTRACTS AWARDED

Brantford, Ont.—Auguist & Whitfield, 40 Colborne St., have the plumbing contract in connection with the erection of a $15,000 factory addition for the Waddell Preserving Co., Ltd.

Halifax, N.S.—Hager & Co., 161 Quinpool, have the plumbing, and Geo. A. Perrier, Granville Street, the heating contract in connection with the erection of an infectious hospital for the City Council.

Moose Jaw, Sask.—The following contracts have been awarded in connection with the erection of a $45,000 children's home for the Children's Aid Society; plumbing and heating, Kennedy & Co., 429 Fourth St. W.

HOW TO MAKE SIMPLE WATER TESTS

To ascertain if water is hard, put a few bits of soap into a little alcohol and dissolve; then add a little of the solution to a glass of water; if hard it will turn milky.

To ascertain if water contains iron, put a small piece of prussiate of potash into a glass of water; if the water contains iron it will become a blue color.

Halifax, N.S.—Plans and specifications are with the superintendent, Joseph M. Tobin, Dennis Building, for the erection of a $50,000 garage and showroom, etc., at the corner of Dresden Row and Spring Garden Rd., for the Modern Garage, Ltd.

Market Conditions and Tendencies

Statements Regarding the Prices and Trend of Supplies.

THE MARKETS AT A GLANCE.

THE outlook for all steel grows more uncertain. The action of the United States Government in taking over the entire output of the mills must result in supplies for commercial requirements reaching a low point. At the present, fair stocks of sheets are reported available, and a very firm undertone exists. The position of wrought iron pipe and boiler tubes is becoming increasingly difficult. Shipments of raw material for pipe to Canada have been within a small range for some time past, and the future holds out the promise of some smaller supplies. Distribution of boiler tubes is being made under Government control, limited quantities only being available, and essential industries receiving first call on stocks arriving.

A further advance in tin of 45c per pound features the metal markets. This, it is intimated, is the result of increased costs, due to advances in primary markets. Stocks are at a very low ebb, and no shipments from Great Britain are reported on the way. Solder has been influenced to higher levels by the increase in tin, and quotations are up from 8c to 10c per pound. Stocks are none too heavy, and manufacturers are trying to equalize distribution as carefully as they can. Spelter, after a period of dulness, has been revived and is firmer. Lead is of little interest and weak in tone.

New discounts have been named on cast and malleable iron pipe fittings which provide for an advance. Other items, though firmly held, show no change in price. Business in some lines is reported very good, while others again are confined to a very limited scope.

TORONTO, May 13—Actual price changes have not been so very numerous during the period since last issue, but a decidedly firmer tone has developed generally owing to the uncertainty of further supplies of steel for commercial purposes. This will exert an almost direct influence on range boilers, wrought iron pipe, black and galvanized sheets, and will be felt in many other items. Pipe fittings have come in for revision upward, and the scarcity and high price of tin has resulted in new high levels being reached in solder. Business generally is considered fair, though in some lines there is very little being done.

Range Boilers Firm Up; Stands Up 20 Per Cent.

RANGE BOILERS.—The action of the United States Government in commandeering the steel output in that country will be felt in many lines, one of which is range boilers. The market on these has stiffened considerably, and the question of ample supplies for the future must remain to a great extent uncertain. An advance has been recorded in boiler stands amounting to about 20 per cent. This, it is said, is the first to be recorded for a long period, and on the basis of to-day's market even higher figures may be reached. Business is not large and the shortage in some sizes continues. Prices are unchanged.

	Standard	Extra Heavy
30-gallon range boilers	$14.00	$17.00
35-gallon	17.00	20.50
40-gallon	20.50	24.00
52-gallon	28.00	32.00
66-gallon	37.00	42.00
82-gallon	45.00	50.00
100-gallon	62.00	70.00

Enamelware Holds In Unchanged Position

ENAMELWARE.—There have been no new and interesting developments during the past couple of week in this line. Business is still within comparatively narrow channels and prices are holding firm and unchanged.

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Sinks, roll rim, 18 x 30 in., staple	16 80
Closets, oak tank and seat	22 00
Do., enamel iron or white vitro tank	23 75

Soil Pipe Very Firm; FittingsGo Higher

SOIL PIPE, FITTINGS.—The high price of pig iron and continued increase in production costs lead to a very firm situation in soil pipe and fittings. Manufacturers indicate they are working along a very narrow margin and prices should be higher, but no change has yet been provided for. Business is reported to be very good. Cast iron and malleable iron fittings have undergone revision upward and new discounts are now ruling. The present selling prices are given below.

SOIL PIPE FITTINGS.

Medium and extra heavy soil pipe, 6-inch and under	35%	2½%
8-inch soil pipe	....	30%
Medium and extra heavy fittings, and under	40%	2½%

C. I. PIPE FITTINGS.

Cast iron fittings	....	10%
Cast elbows, tees, etc.	....	10%
Plugs	....	20%
Bushings	....	20%
Flange unions, standard	....	10%
Dart unions, ¼-inch to 2-inch	20%	25%
Do., 4½ in. and larger	....	15%
Nipples, up to 4-inch	....	45%
Do., 4½-inch and larger	....	40%
Do., running thread 4-in. and under	....	25%
Couplings, 4-in. and under	....	35%
Do., 4½ in. and larger	....	15%

MALLEABLE FITTINGS.

	Black	Galv.
Malleable Fittings, Class A, lb.	0 56	0 66
Do., Class B, lb. net	0 24	0 34
Do., Class C, lb. net	0 16	0 24

Waste Holds Firm; Oakum Steady

WASTE, OAKUM.—Prices established on waste as shown in last issue have been firmly maintained, and nothing new has entered into the situation since. Stocks are in good shape and orders in good volume are being shipped out. Oakum is steady and a fair demand is being taken care of satisfactorily. Prices show no change from the decline put into effect a couple of weeks ago, and range as follows:

	Per 100 lbs.
Best American	$21 50
Clipper, spun	21 00
Do., unspun	19 50
Plumbers', spun	10 00

Valves Show No Change, Moving Out Freely

VALVES.—Valves show no change during the past couple of weeks, though reports indicate that a very fair movement exists. Prices have held very firm and unchanged, and nothing of an interesting nature is to be noted.

	Discount off list
Ground work	50
Compression work, standard	52
High grade	45
Cushion work	46
Fuller work, standard	50
High grade	43
Basin cocks, No. 0 standard	46
Nos. 1 and 2	46
Bath cocks	53
Flatway stop and waste cocks, standard.	53
High grade	50
Roundway stop and waste cocks, standard	53
High grade	50
Brass steam cocks, standard	Net
Globe, angle and check valves, standard.	10
Do., removable seat	7½

Radiator valves, standard	15
Do., removable seat	10
Patent quick opening valves	35
Basin Cocks—	
No. 0 and 1, Fuller pattern	50
No. 0 and 1, compression	46
Midget	50
Globe, angle and check valves, medium pressure	30
Radiator valves, standard	30
Radiator valves, Jenkins disc	30
Radiator valves, quick opening	40

Wrought Iron Pipe In Uncertain Position

WROUGHT IRON PIPE.—Government business in wrought iron pipe, along with the taking over of the steel output in the United States will undoubtedly exert a decided influence on the situation here. For some time past there have been increasingly apparent difficulties in getting through shipments of skelp, and the new order of things will tend towards creating a famine in this commodity here. Stocks are none too heavy at the present juncture and there is little chance of any improvement developing. Prices are very firmly held, but unchanged on basis of quotations shown in panel.

WROUGHT IRON PIPE

Effective Feb. 26, 1918

Standard Buttweld—	Per 100 feet Black	Galvanized
⅛ in.	$ 6 00	$ 8 00
¼ in.	5 16	7 29
⅜ in.	5 16	7 29
½ in.	6 55	8 12
¾ in.	8 28	10 41
1 in.	12 24	15 39
1¼ in.	16 56	20 82
1½ in.	19 80	24 89
2 in.	26 64	33 49
2½ in.	42 71	53 53
3 in.	55 85	70 00
3½ in.	70 84	87 76
4 in.	83 93	104 10
Standard Lapweld—		
2 in.	29 60	36 08
2½ in.	44 46	54 70
3 in.	58 14	71 53
3½ in.	72 68	90 62
4 in.	86 11	107 37
4½ in.	97 79	122 56
5 in.	114 00	142 82
6 in.	147 80	185 28
7 in.	192 80	241 57
8 L in.	202 50	253 75
8 in.	233 30	292 32
9 in.	279 50	350 18
10 L in.	259 20	324 80
10 in.	333 70	418 18

Terms 2% 30 days, approved credit.
Prices—Ontario, Quebec and Maritime Provinces.

Government Watching Delivery Boiler Tubes

BOILER TUBES.—A couple of cars of boiler tubes have reached the city, but distribution of these is being watched very carefully by the Government. The situation in wrought iron pipe applies largely in respect to boiler tubes as far as output is concerned, and this will mean that supplies will be watched to assure absolutely essential industries' needs being taken care of. Quotations hold without change.

Toronto—	Per 100 feet Cold drawn	Lapweld
1 inch	$36 00	$ ....
1¼ inch	40 00	....
1½ inch	43 00	36 00
1¾ inch	43 00	36 00
2 inch	50 00	36 00
2¼ inch	53 00	38 50
2½ inch	55 00	42 00
3 inch	64 00	50 00
3¼ inch	....	58 00
3½ inch	77 00	60 00
4 inch	90 00	75 00

Plates Firming Up; Supplies Uncertain

SHEETS, PLATES. — A decidedly firmer tendency is to be noted in plates during the week, and an advance would not come as any great surprise. The future of sheets as regards supplies is decidedly uncertain, and little in the way of shipments for commercial use can be expected for the next two or three months. Here again the action of the United States Government in taking over the output of the steel mills will be felt keenly. Stocks in some quarters are in fair shape, but in others again sizes and gauges are being broken into pretty extensively. Prices have a very firm undertone, and though no changes have been made a narrowing of the range of prices may be looked for as supplies diminish.

BLACK SHEETS—		Per 100 lbs.	
10 gauge	$....	$9 50	$12 00
12 gauge	7 15	9 60	10 00
14 gauge	7 20	8 15	8 40
16 gauge	7 25	8 25	8 50
18-20 gauge	7 30	7 80	8 05
22-24 gauge	7 35	7 85	8 10
26 gauge	7 40	7 90	8 15
28 gauge	7 50	8 00	8 25
3-16-inch plate	....	9 10	10 25
¼-inch boiler plate	....	9 00	10 00
GALVANIZED SHEETS—			
10¾ oz.	$9 00	$9 25	$9 50
U.S. 28	8 70	8 95	9 20
U.S. 26	8 40	8 65	8 90
22 and 24	8 25	8 50	8 75
18 and 20	8 10	8 35	8 60
16	7 95	8 20	8 45
14	7 85	8 10	8 35

Solder Advances From 8 to 10c Per Pound

LEAD AND ZINC PRODUCTS.—Solder has again featured this market since last issue, and an advance of 8c to 10c per pound has been named. These quotations are said to be nominal and based on to-day's tin market, and some doubt was expressed as to whether solder would soon be available even at enhanced values. The range of prices now being made is exceptionally wide. Quotations on guaranteed range from 66c to 68c per pound; on strictly from 60c to 66½c per pound; on commercial from 55c to 62c per pound; and on wiping from 54½c to 56c per pound. Manufactured lead and zinc products have undergone no change, and prices are being held firm in spite of some fluctuations in the metal markets.

Lead pipe, lb.	$ 0 14	$ ....
Lead waste pipe, lb.	0 15	....
Lead traps and bends	Net list	
Lead wool, lb.	0 16	
Lead sheets, 3 to 3½ lbs. sq. ft., lb.	0 13¼	
Lead sheets, 4 to 8 lbs. sq. ft.	0 12½	
Cut sheets, ¾c lb. extra, and cut sheets to size, 1c lb. extra.		
Solder, guaranteed, lb.	0 66	0 68
Solder, strictly, lb.	0 60	0 66½
Solder, commercial, lb.	0 55	0 62
Solder, wiping, lb.	0 54½	0 56
Solder, wire, lb.	0 65	0 70
Zinc sheets, per lb.	0 26	....

Old Materials Unchanged; Scrap Metals Strong

OLD MATERIALS.—The general trend of old materials is along uninteresting lines, and dealers are still awaiting something to crop up which will revive interest in these lines. Scrap metals are very firm and reaching a point where higher values are in sight. A heavy demand for melting steel is anticipated. The interpretation placed on the action of the United States Government in using the entire mill output for sixty days by dealers is that this will mean increases in the scrap trade. To give an idea as to the business being done now, one firm dealing in scrap metals is about concluding an agreement with a munition firm for their cuttings for three months, the amount involved, it is intimated, being in the neighborhood of $200,000.

Tea lead	$ 0 04½	....
Heavy lead pipe	0 07	0 07½
Yellow brass	0 12	0 13
Red brass	....	0 21
Light brass	....	0 09½
Heavy zinc	0 05½	0 06
Heavy copper	0 21½	0 22
Stove plate, per ton	17 00	18 00
Old cast iron, per ton	25 00	26 00

Tin Reaches $1.50; Spelter Firm, Lead Weak

INGOT METALS. — Higher levels have been reached in prices on tin since last issue and no further supplies are in sight. Spelter is somewhat firmer in tone, and antimony shows some strength. Lead is unchanged, with a poor demand reported. The question of raising prices on copper was discussed in Washington at a meeting held a few days ago, but no decision was arrived at. Business locally continues fairly brisk.

COPPER.—From a commercial standpoint there is nothing to report in this metal, little being used except for war purposes. The War Industries Board and the copper interests met in conference in Washington recently, but adjourned until May 22 without arriving at any decision in regard to revising the fixed price of copper. It is understood that an increase from 23½c to 24½c a pound will be asked, the advance to be used chiefly to offset the higher refinery costs. Prices hold nominally at about 30c per pound.

TIN.—The tin situation is unchanged and the shortage continues acute. There is little spot metal of any grade for sale, and only Chinese tin apparently can now be purchased for future shipment from the Far East. Tin has again advanced locally, and is now quoted at $1.50 per pound, an advance of 45c since last issue. It is intimated that the advance in price is not speculative, but rather due to increased costs following advances in primary markets.

SPELTER.—The market is firmer after a period of dullness, due to a report that the United States Government has purchased a large quantity of high grade spelter—9,000 tons, it is said, at around 10c, St. Louis basis. Prime Western spelter continues quiet and the market featureless. The local price of spelter is unchanged at 9c per pound.

LEAD.—The primary market is easier and lower prices would not be unexpect-

Continued on page 30.

GOSSIP OF THE TRADE

OXFORD SOLDIER KILLED

Another of "Oxford's Own" has been killed in action. Official notification was received recently that Pte. William Brabyn had made the supreme sacrifice on April 5. He was born in Woodstock and was a plumber by trade. He was previously reported wounded last May, but returned to the front six weeks later.

DEATH OF MR. JOHN JACKMAN

Mr. John Jackman, for twenty-eight years a sanitary inspector in the Medical Health Department at the City Hall, Toronto, died recently at his home, 376 Parliament street, at the age of 68 years. He was a veteran of the Fenian Raid of 1866, and was a member of the Queen's Own for fourteen years.

WINDSOR EX-ALDERMAN DEAD

Thos. Blackburn, 76 years old, a resident of Windsor for 48 years and an ex-alderman, died recently. He carried on an extensive plumbing business for many years, retiring in 1908. He was a native of Bowmanville. Besides a widow he is survived by three daughters and two sons, all residing in this city.

WATER BURNED AS FUEL

A New York engineer, Mr. William L. Coultas, has invented a furnace which burns water as fuel.

The water, be it said, does not burn alone, but in combination with an equal part of crude oil, gasoline, petroleum, or even tar; any oil that will flow freely through a half-inch pipe will serve equally well as the finest of kerosene.

The combustion of water is based upon the fact that when a fine stream of water is passing through an intensely hot metal coil it is not only turned into vapour, but the water molecules are split up into their constituent elements, oxygen and hydrogen.

The oil is ignited, and the flame from this passes up through a coil of copper tube, making it red hot; water is then turned into the hot coil, where it is disintegrated by the heat, and the oxygen and hydrogen gases which result emerge into the oil flame. The oxygen feeds the flame to great intensity and the hydrogen burns with the hydrocarbons of which the oil is composed.

MAKE A GOOD LONG DISTANCE SHOT

In a letter from one of the boys in training overseas, he writes that he had just got over an 18-mile march to a shooting range, his score being as follows: 12 points out of 20 at 100 yards, 14 points out of 20 at 200 yards; 16 points out of 20 at 400 yards. He concluded his remarks by saying he would



PTE CLARENCE E. PADDON.

be able to score all bulls at about a mile. Let us hope he is able to spot Bill at any old distance. "Bulls is Bulls" these days and one real fat one would be worth a million "Kaiser Bills." The "boy" overseas referred to is Clarence Paddon of Robert Paddon & Co., Windsor, Ontario.

APRIL BUILDING PERMITS FOR HOUSES 108

Building operations in Toronto this season include many dwellings, the demand causing offers of rents that meet the increased cost of construction. For April of this year the City Architect granted permits for 108 dwellings, to cost $259,680. For April, 1917, the number was 91 and value $228,900, while for April, 1916, the number was 59 and value $171,200, which is equal to nearly twice the number of dwellings erected in April, 1916.

The first four months of this year the number of permits for dwellings was 167, to cost $459,480. For the same period last year the number was 207, and value $504,225. For the same period in 1916 the number was 116, and value $314,050.

It is evident that home-making in this city is not seriously affected by the handicap in building. Fully two million dollars a year are going into new dwellings, although the cost of construction has advanced 50 per cent. This proves that the sanitary and heating business is at least improving very nicely.

VETERAN PLUMBER DIES

The late John Burns died in Montreal on April 29th and was laid to rest the following Wednesday.

Mr. Burns came to Montreal when a very young man from Quoniamstown, near Downpatrick, Ireland, where he was born 75 years ago. Over 50 years ago he started business on his own account and for about 53 years John Burns & Co. have served a large and growing list of customers, among them many of the oldtimers of Montreal.

One of the outstanding things commending Mr. Burns to a large circle of acquaintances was his geniality. Many who did not know him at all by name were attracted by the pleasing personality he possessed.

For many years the John Burns Co. has conducted a large business in plumbing, steamfitting and range making. The latter feature was one in which Mr. Burns took considerable pride and many improvements were the product of his brain and were duly patented. And it is noteworthy that for over fifty years the business has been conducted within a very short distance of the present premises, Craig Street locations having been favored until the present move to 5 Bleury Street—this being under way at the time Mr. Burns died.

The father's mantle now falls upon Leo E. Burns, a son who has seen active service. As a matter of fact Mr. Leo Burns was called home from the front to assume the active management of the business a few months ago. He was overseas as a lieutenant with the Irish Rangers when word came that the serious illness of his father would be incurable. A reorganization of the company was decided upon and a joint stock company formed just about the time that Mr. Burns was taken ill.

Mr. Burns leaves to mourn his loss Mrs. Burns and Lieut. L. E. and F. J. Burns of Montreal and T. H. Burns of Ottawa. One daughter lives at home and was a faithful attendant upon her

father's wants to the close of his life.

The business will, of course, be continued in the newly-occupied premises at 5 Bleury Street. Besides larger accommodation here for the development of the business, the top floor of a good-sided block opposite has been secured and the manufacturing and heavier work will largely be conducted there.

WELL-KNOWN SPRINKLER MAN DEAD

On Saturday, April 27th, there died at his home in the city of Montreal W. H. Whitehead, a well-known figure in trade circles.

Mr. Whitehead was for many years manager of the H. G. Vogel Sprinkler Co. of Canada, Ltd., and was well-known to the trade through his connection with this firm. His acquaintance was wide and throughout parts of the States he was well-known to many and had a wide acquaintance with underwriter men of many centres.

For the past eight years Mr. Whitehead was connected with the Garth Co. at 28 Craig Street and was sprinkler engineer for this firm. His illness was of but short duration, pneumonia having stricken him down just two weeks prior to his demise.

Mr. Whitehead was an active member of the Masonic Fraternity. He was 38 years of age and married Miss Louise Garth, the second daughter of Mr. H. W. Garth of the Garth Co., Montreal. Mrs. Whitehead and one daughter are left to mourn the early demise of their husband and father.

WATERWORKS, SEWAGE

Summerside, P.E.I.—Town Council contemplate the construction of a sewer.

Matane, Que.—By-law will be voted on for waterworks system costing $75,000.

Leamington, Ont.—Tenders are being received for drainage work for the Town Council.

Bobcaygeon, Ont.—Town Council contemplate the construction of a 12-inch tile drain.

Woodstock, Ont.—The City Council contemplates the construction of glazed tile sewers.

Southwold Township, Ont.—The construction of tile drains and culverts is contemplated.

St. Mary's, Ont.—Town Council contemplate replacing some watermains with larger ones.

Sackville, N.B.—The Town Council contemplates improvements to the waterworks system.

Nakusp, B.C.—The Municipal Council contemplate the construction of a water system costing $26,000.

Chicoutimi Parish, Que.—Tenders are being called for the construction of a $55,000 waterworks system.

Lethbridge, Alta.—The Waterworks Commission contemplate the installation of meters throughout the city.

Malden Township, Ont.—Tenders are being called for the construction of the Collision and 8th Concession drains.

Shawinigan Falls, Que.—City Council contemplate the construction of a sewer system and pavements costing $100,000.

Hamilton, Ont.—The City Council contemplates the extension of the city waterworks service to Barton Township.

Gosfield South Township, Ont.—Tenders are being received for repairs to drain No. 47 for the Township Council.

Montreal, Que.—Tenders are being received for the construction of drains for the Federal of Jewish Philanthropies.

Leamington, Ont.—Tenders will be called for the construction of a reinforced concrete 650,000 gallon capacity reservoir.

Mersea Township, Ont.—Town Council will improve the McClatchey drain at a cost of $667. Some other drainage work is being contemplated.

Amherst, N.S.—The Town Council contemplates alterations costing $7,000 to waterworks system and the construction of sewers costing $10,000.

Oxford Township, Ont.—Tenders have been called for the repairing and improving of the Cassey-Wylie drains, and a branch of the Massey drain.

Sherbrooke, Que.—The city will resume work on the construction of the trunk sewer which was contemplated last year in the south ward. The cost of same when completed will be $75,000.

Parry Sound, Ont.—The Council contemplates installing sewers to the new school, at a cost of $4,300. A sewer from the corner of Beaver and Meadow streets to Sequin River has also been approved.

Windsor, Ont.—The following contracts have been let by the City Council: Pierre Ave. sewer, Adams & Oldani, $7,438; Windsor Ave. sewer, Chick & Co., $58,015; Langlois sewer and Benjamin Ave., Merlo & Ray, $38,067.

South Vancouver, B.C.—The Vancouver and District Joint Sewerage Board has recently inspected lands west of Central Park in South Vancouver, relative to the recent application of the local council for the construction of a large sewer.

CONTRACTS AWARDED

Hamilton, Ont.—A. Rogers & Son, 752 King St. W., have plumbing contract for $20,000 factory addition for Wagstaffs, Ltd.

Brantford, Ont.—Aguish & Whitfield, 40 Colborne St., have heating contract for a $15,000 factory for the Waddell Preserving Co.

Peterboro, Ont.—Gurney Foundry Company has the heating contract in connection with the erection of a $25,000 residence for R. M. Waddell.

Morris Township, Ont.—J. C. Hay, Listowel, Ont., has the contract for tile in connection with the construction of the Bone drain for the Town Council.

Montreal, Que.—M. J. Quigley, 4228 St. Catherine St., has plumbing and heating contract in connection with alterations to garage for Waring & Gillow, Ltd.

Montreal, Que.—Ulric Boileau, 312 Fabre Street, has the general contract and will let plumbing contract for the erection of St. Stanislaus Church, costing $250,000 for the Roman Catholic Congregation.

Pabos Mills, Que.—J. H. Morin & Fils, Trois Pistoles, have the general contract and will let plumbing and heating contracts for the erection of an $11,200 presbytery.

Toronto, Ont.—C. C. Hicks, 741 Lansdowne Ave., has the heating contract in connection with the erection of a $10,000 factory for R. Thompson, who wants tenders on plumbing.

Dundas, Ont.—H. G. Waterman & Co., Toronto, has the heating contract and L. Ties, Dundas, has plumbing contract in connection with the erection of a $14,000 residence for Lieut.-Col. Gwyn.

CONSTRUCTION

London, Ont.—T. M. Knowles Company will rebuild their plant at a cost of $15,000.

Moncton, N.B.—The Hospital Board contemplate the erection of a $30,000 addition to hospital.

Edmonton, Alta.—City Council contemplates the erection of an extension of telephone plant.

Lethbridge, Alta.—P. Burns & Co., Third Ave. S., contemplate the erection of a $20,000 abattoir.

Blenheim, Ont.—A large two-storey garage will be erected on the site of the old Buzzard House, Talbot St.

Toronto, Ont.—Murray-Kay, Ltd., 17 King Street E., will make alterations costing $15,000 to their store.

Toronto.—C. S. Lucas, 2 Eaton Ave., will erect three two-storey brick stores and apartments costing $10,000.

Kitchener, Ont.—Casper Braun, 295 King W., has the general contract for $12,000 factory for Geo. Schlee.

Windsor, Ont.—Plans are being prepared for the erection of a $30,000 Sunday school for All Saints Church.

Springfield, Ont.—The Springfield Milk Company contemplate the erection of a $20,000 brick storage building.

London, Ont.—The Cronyn Memorial Church Congregation contemplate the erection of a $10,000 addition to church.

Bathurst, N.B.—Kenneth G. Rea, 385 Beaver Hall Hill, Montreal, is preparing plans for a bank for the Bank of Montreal.

Wallaceburg.—The Dominion Glass Co., head office Toronto, contemplate the erection of a $200,000 producer gas plant.

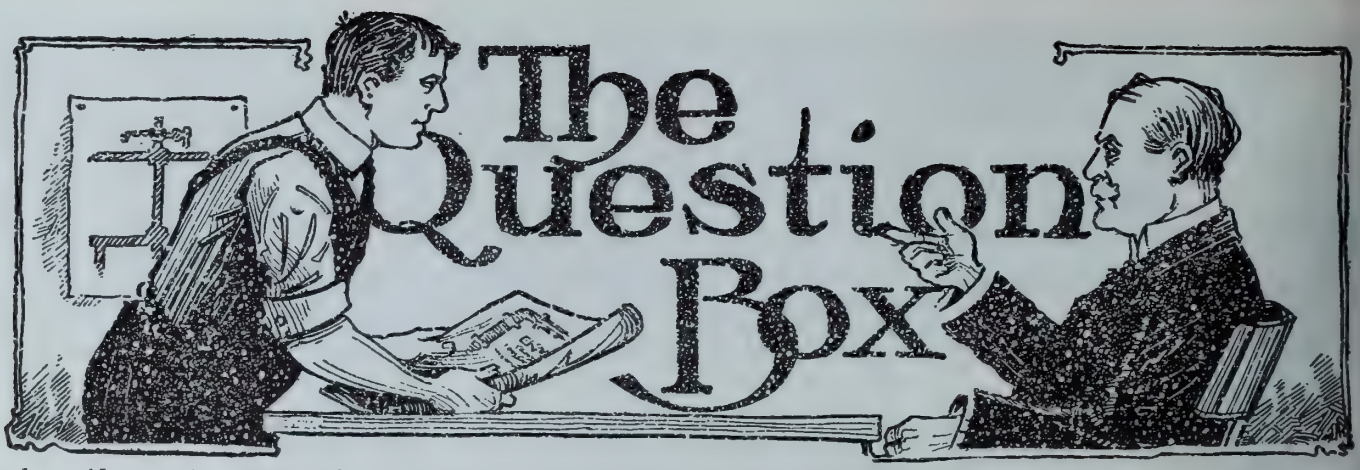
Montreal, Que.—J. E. A. Benoit, 1196 Wellington St., is preparing plans for a $60,000 two-storey Roman Catholic Chancel.

Montreal, Que.—Lamontagne, Limited, 338 Notre Dame Street West, contemplate the erection of a five-storey factory.

Arnprior, Ont.—Factory owned by F. R. Rudd, Madawaska Street. Loss $25,000. Will rebuild at a cost of about $40,000.

Rossland, B.C.—Ross Thompson contemplates the erection of a three-storey brick business building at Columbia and Spokane.

Continued on page 30.



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

WHAT IS A CLOSED OR HIGH PRESSURE HOT WATER SYSTEM?

Editor, SANITARY ENGINEER.—I do not recall ever reading an article in your journal describing what is called a high pressure hot water system or closed system, and, frankly speaking, I do not know what such an installation is like. Would you describe such a system in an early issue of SANITARY ENGINEER? My chief reason for so asking this question is that it may be possible that such a system would be likely to save coal. Another question I would like to ask is, if a heat generator or booster is put on a hot water system what does really take place? How is it that a higher temperature is claimed for a system when such an appliance is fitted to a system? And to what degree of temperature is it possible one of these appliances will raise the water?

HOT WATER FITTER.

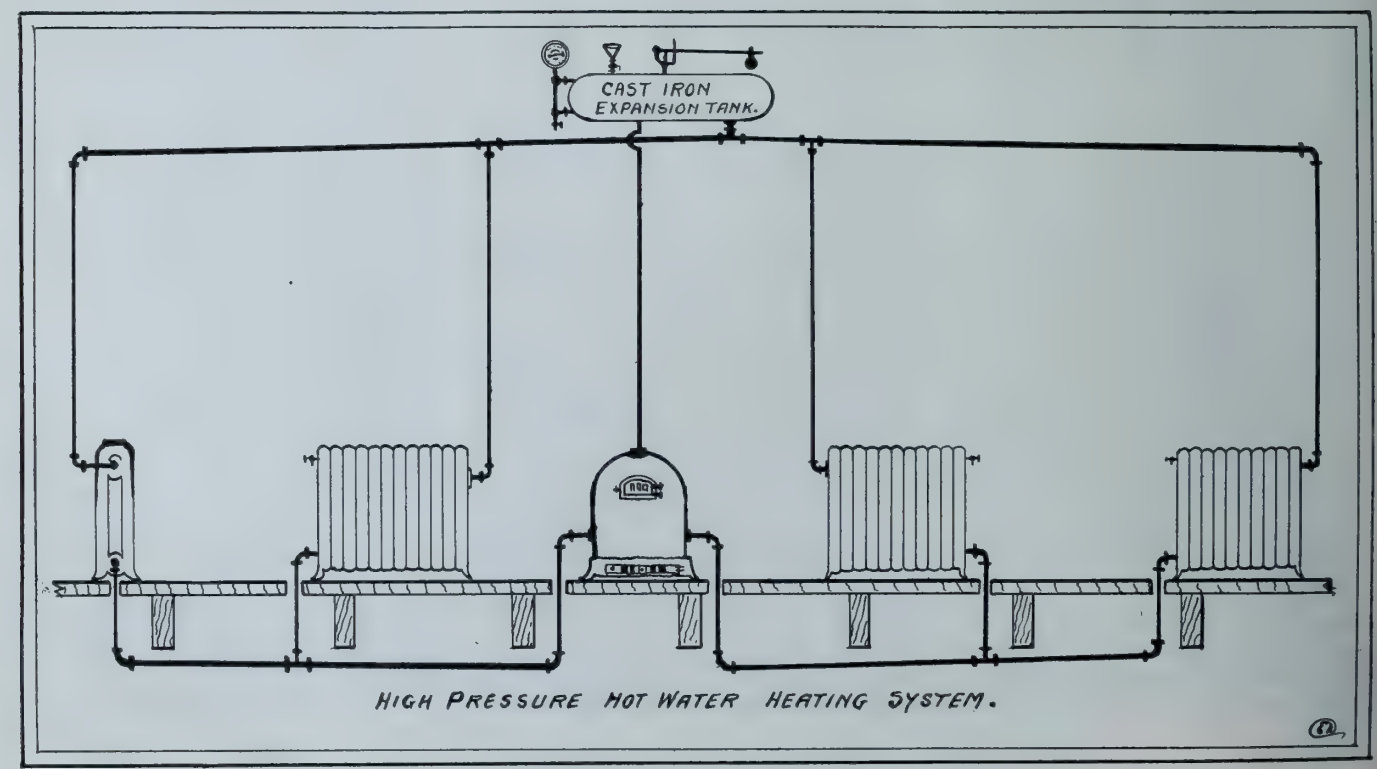
These questions have a great deal of bearing upon each other. A closed hot water system could be termed a pressure system and could not. At the same time a closed system really is a pressure system except that to many heating engineers it may not seem so. But we would be inclined to think that a closed system must be a pressure system of a type. The accompanying illustration shows what would be rightly called a high pressure system.

PRESSURE		TEMPERATURE
POUNDS PER SQ. INCH ABOVE ATMOSPHERE	EQUIVALENT HEAD IN FEET (APPROX.)	DEGREES OF BOILING POINT (FAHT.)
0	0	212
5	12	228
10	24	240
15	37	250
20	49	259
25	61	267
30	74	274
35	87	280
40	100	287
45	113	292
50	125	297
55	137	302
60	151	307
70	177	316
80	205	324
90	237	332
100	260	338
125	327	352
150	393	365
175	469	378
200	540	388

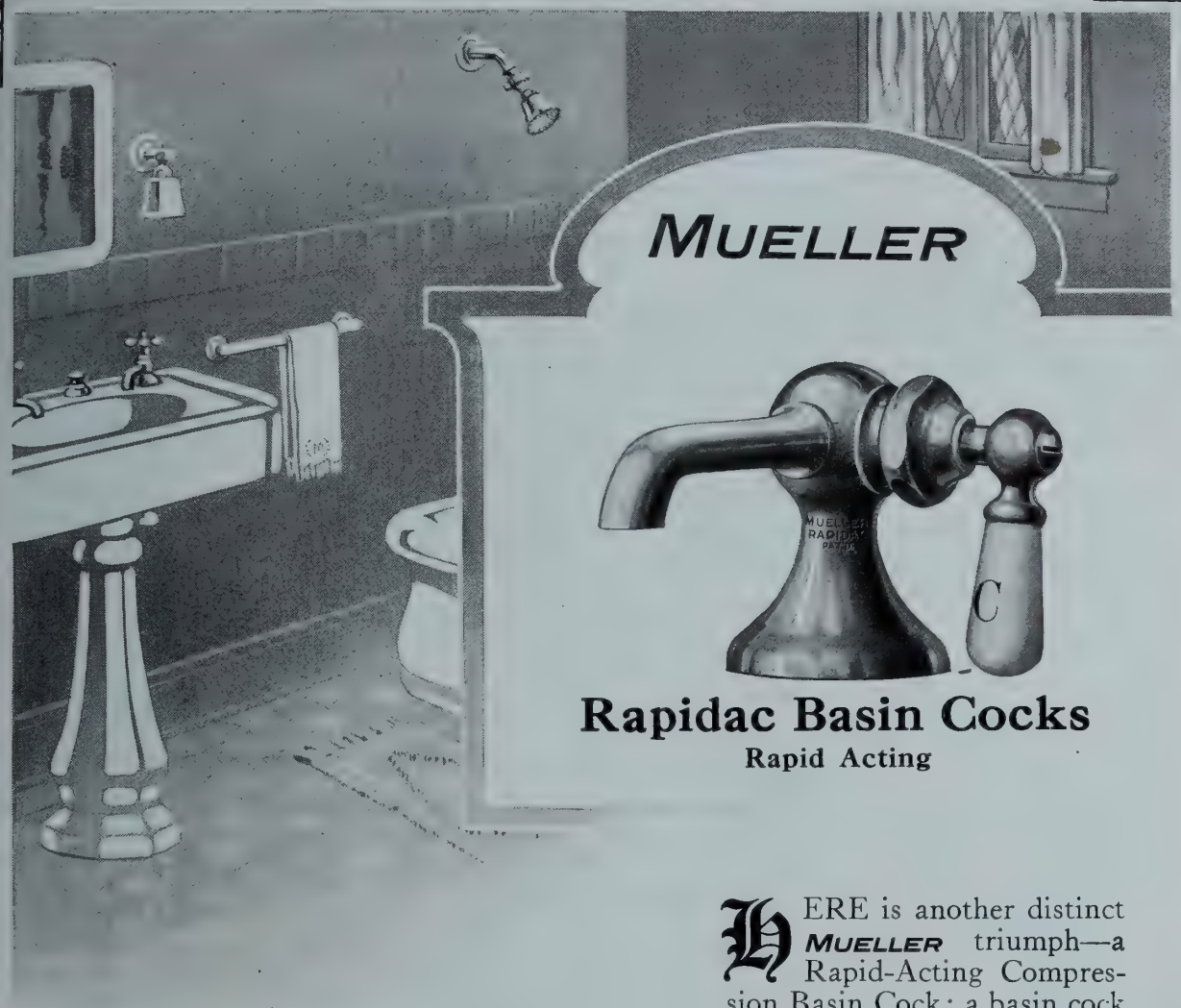
TABLE SHOWING TEMPERATURE OF BOILING POINT WITH RELATIVE INCREASE OF PRESSURE.

It will be noted that a cast iron expansion tank is placed directly over the heater, and the expansion pipe connected to the top of the same. A safety valve and pressure gauge is fitted to the expansion tank, as also is the usual water gauge glass and trimmings. This type of hot water heating system was at one time very popular in England and Scotland. It is almost similar in many respects to the Baker system of car heating. If such a system were to be installed it should be fitted with a closed type of safety valve, with a discharge outlet that could be fitted with an open end pipe.

Continued on page 30.



HIGH PRESSURE HOT WATER HEATING SYSTEM.



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QUESTION BOX

Continued from page 28.

It will be seen that this system is really a closed system, simply because there is no free opening to the atmosphere as would be the case if the expansion tank had an open vent, such as was described in the articles which appeared in the April 1 and 15 issues. But at the same time the one described in the accompanying illustration is a high pressure system.

Now, a closed system could also be described as one that is fitted with a heat generator or temperature booster because, while the expansion tank is open to the atmosphere, the heating system is not. But at the same time such a system could not rightly be termed a high pressure system. It could at the same time be termed a pressure system, because of the fact that a given pressure is exerted upon the hot water heating system.

The accompanying table shows to what degree of temperature water can be raised when certain pressures are allowed to be generated. It will be plainly seen, therefore, that pressure on a heating system has a great deal to do with temperature, whether it be a steam or hot water heating system, and, of course, when a pressure is placed upon a heating system smaller pipe can be used in almost every case, depending greatly upon the method of pipe and care taken when installing same.—Editor.

GOSSIP OF THE TRADE

Continued from page 27.

Fort William, Ont.—Tenders will be received up to May 10th for erection of a Collegiate building for the Board of Education.

Toronto, Ont.—Tenders for the construction of a bakery for the Ideal Bread Co., Ltd., 183 Dovercourt Road, will be called shortly.

Hamilton, Ont.—The Provincial Government and the city contemplate the erection of a $300,000 technical school on Wentworth St.

Cornwall, Ont.—Henry Williams has the general contract for $25,000 mill and brick addition to paper mill for the Toronto Paper Co.

Hartland, N.B.—Hatfield & Scott, Ltd., contemplate the erection of brick bank building and offices costing between $10,000 and $12,000.

Peterboro, Ont.—Tenders are now being received for the erection of a $40,000 steel terra cotta and brick building for Robt. Neill Co., Ltd.

Ottawa, Ont.—S. Luke's Hospital, Elgin St., and the Protestant Hospital General, 589 Rideau Street, contemplate the erection of a hospital.

Montreal, Que.—Bigoness & Bigoness, 60 Notre Dame St. E., will call tenders for the erection of a church for the Notre Dame Du Bon Pasteur.

Pointe aux Trembles, Que.—Tenders will be called for the erection of an office and factory building, costing $20,000, for the Home Cigar Company, Ltd.

Halifax, N.S.—Tenders are being received for repairs and alterations, costing $18,000, to the Institute for the Deaf and Dumb, Gottingen Street.

St. Chrysostome, Que.—The Bank of Commerce, head office, Montreal, contemplate the erection of a bank building to cost between $10,000 and $15,000.

Murray Bay, Que.—Tenders are being called for the erection of a $25,000 stone and brick bank for La Banque Nationale, head office 101 St. James St., Montreal.

Montreal, Que.—E. Laurie & Co., 243 Bleury St., have been appointed architects for a five-storey factory for Lamontagne, Ltd., 338 Notre Dame St. W.

Lachine, Que.—Alex. Laplante, 622 St. Joseph Street, Lachine, will erect a $29,000 brick motion picture theatre and will let plumbing, and heating contracts.

Edmonton, Alta.—Plans have been drawn for a $3,000 concrete warehouse to be erected this spring by the Dominion Bottling Works, 10172 94th Street.

St. Alexis, Que.—Tenders will be called locally by the Roman Catholic Congregation for the erection of a $15,000 two-storey frame and brick presbytery.

Quebec, P.Q.—A permit has been granted for the remodelling of the Christian Brothers Commercial Academy building on Cook Street. Cost, $40,000.

Thorold, Ont.—Piggott Healey Construction Co., 36 James St. S., Hamilton, have the general contract for $50,000 addition to factory for the Beaver Board Company.

Montreal, Que.—E. Martel, 631 Frontenac St., general contractor for $13,000 church for the Roumanian Orthodox Church, will let heating and plumbing contracts.

Verdun, Que.—Mr. J. McCormack has the general contract, and will receive tenders on all trades for the erection of two buildings costing $30,000 for Mrs. J. McCormick.

London, Ont.—Tenders will be called for the erection of a $40,000 addition to asylum building for the Department of Public Works, Provincial Government, Toronto.

Halifax, N.S.—The Maritime Engineering & Construction Co., Queen Bldg., have the general contract for the erection of a $14,000 infectious diseases hospital for the city council.

London, Ont.—Dr. W. J. Stevenson, the Ontario Garage Co., cor. Waterloo and Dundas Sts., contemplate rebuilding garage and showrooms which were destroyed at a loss of $47,000.

MARKET CONDITIONS

Continued from page 25.

ed. The weakness in the market is attributed to an increase in Mexican production and lack of buying for domestic account, the latter being probably due to the expectation that the market will go lower. In the meantime local price of lead is unchanged at 8¾c to 9¼c per pound.

ALUMINUM.—The market continues steady. Practically all the aluminum output is being taken by the United States Government at the fixed price of 32c for 98 to 99 per cent., in 50-ton lots. Local price, 50c per pound.

ANTIMONY.—The demand is more active and market slightly firmer. It is understood that the United States Government has asked bids on 1,000 tons of antimony for May-June delivery. Prices here are firm at 16c per pound.

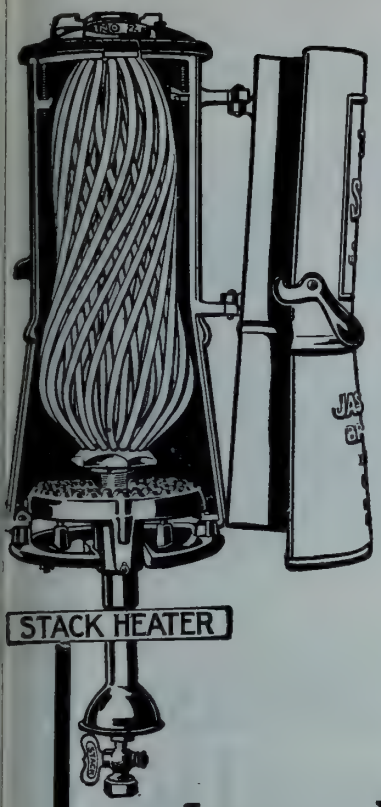
PIG IRON.—There is nothing new to report in the pig iron situation locally. Supplies show little, if any, improvement, all pig iron produced going into consumption almost immediately. With the action of the United States Government in commandeering output of steel mills, furnaces will now direct their entire efforts to war work and commercial requirements will receive little consideration.

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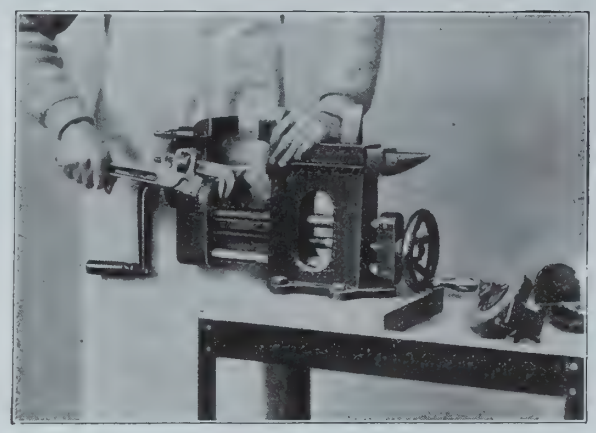


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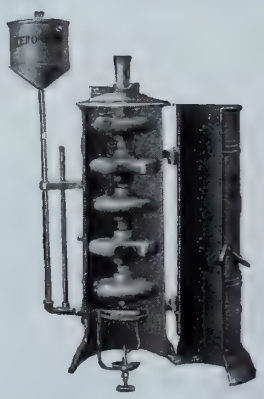
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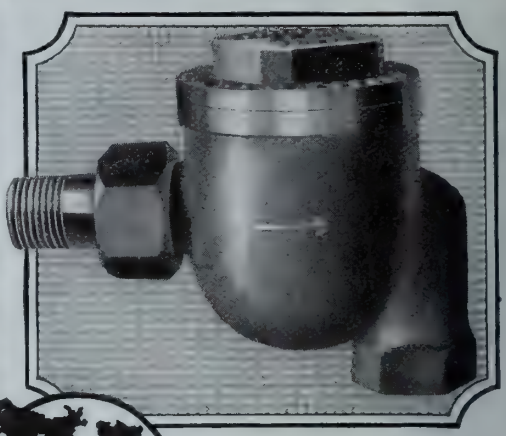


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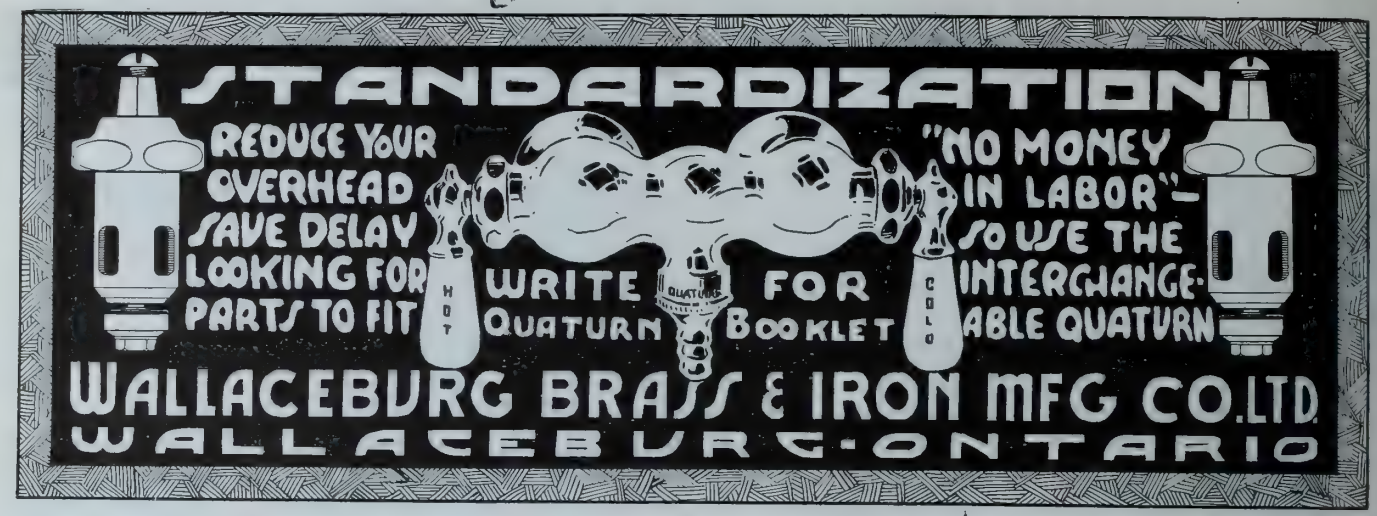
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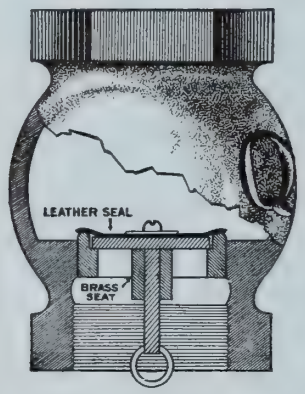
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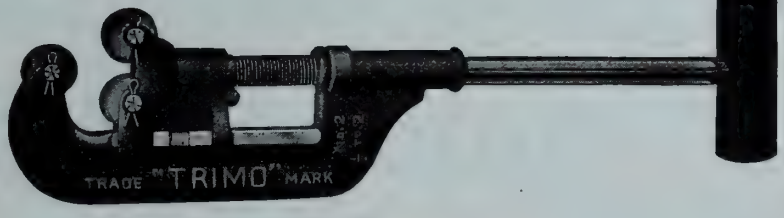
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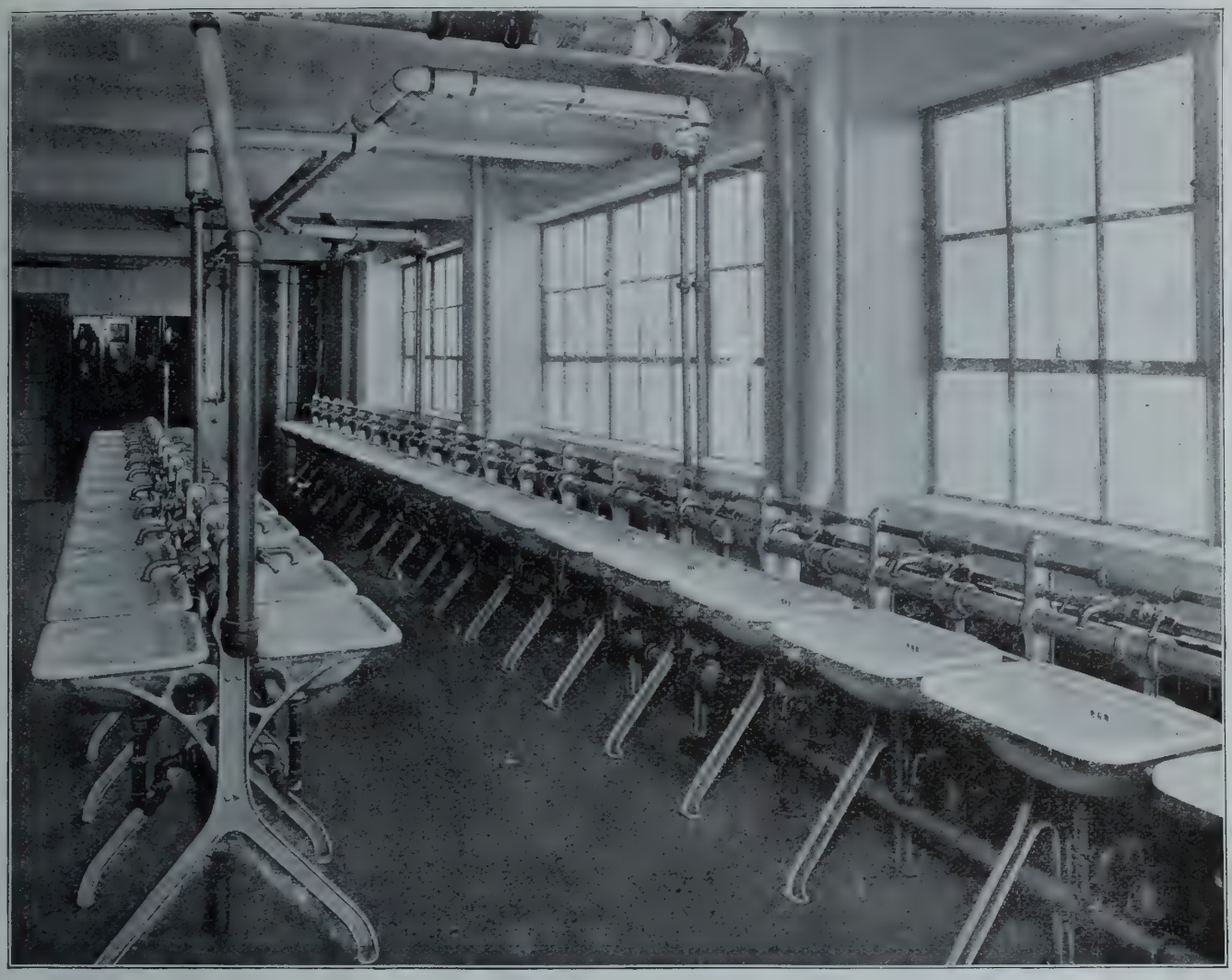
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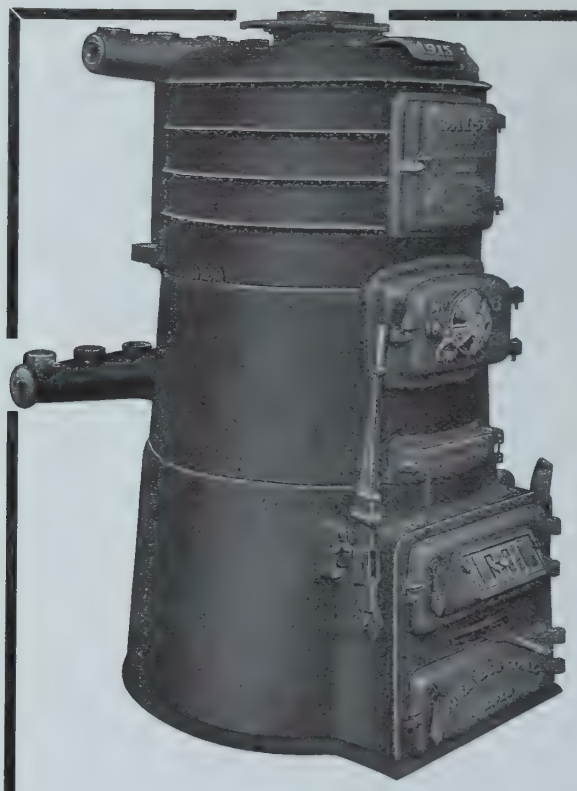
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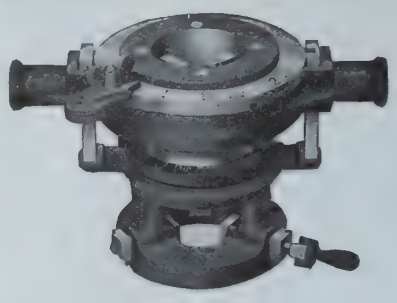
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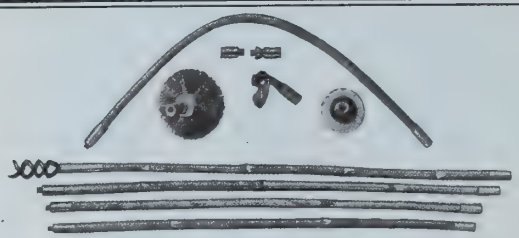


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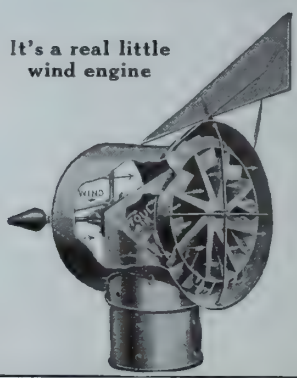
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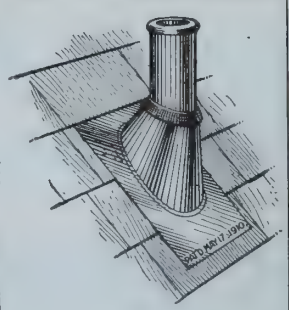
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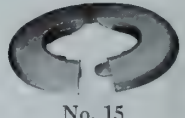
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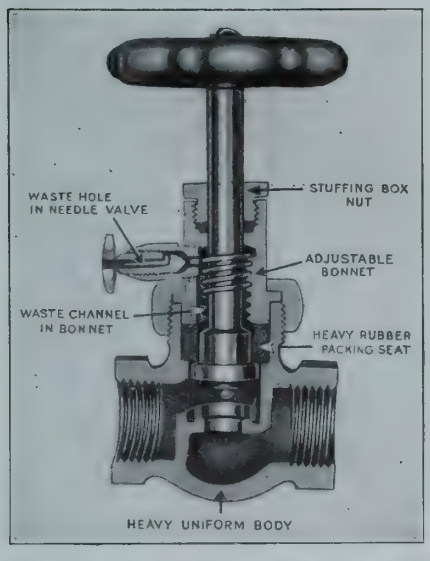
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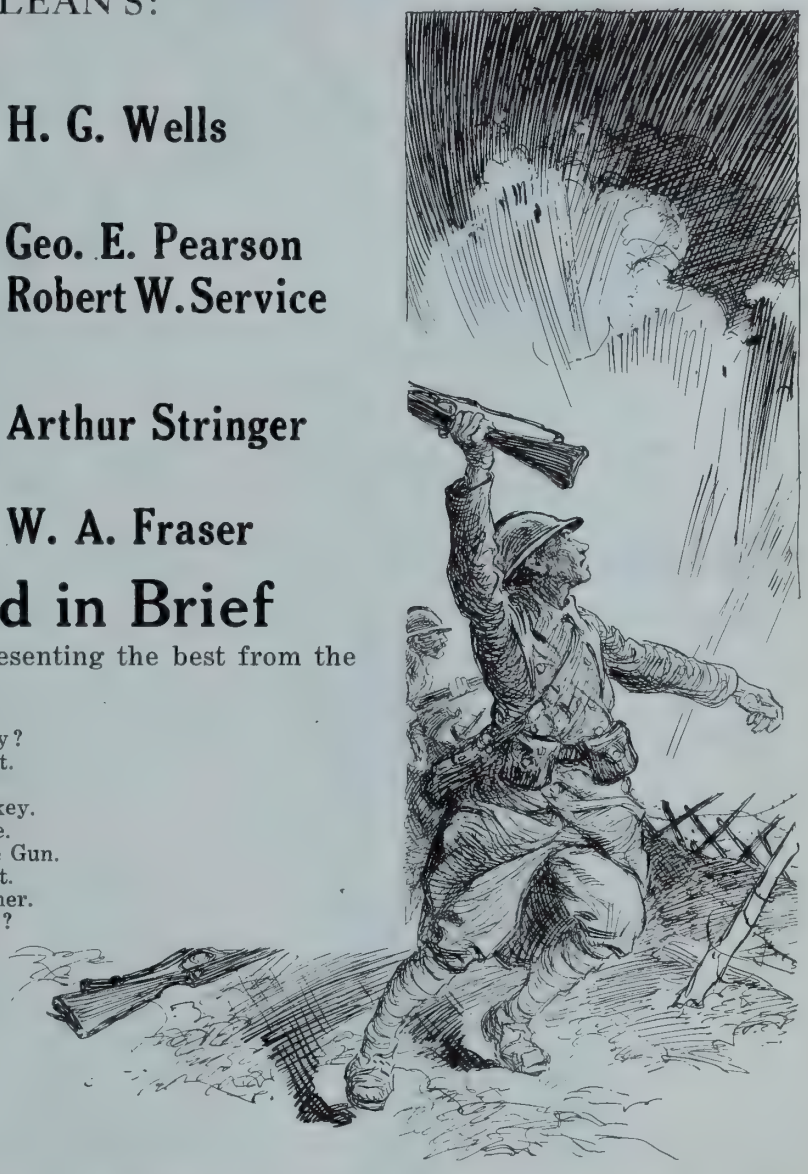
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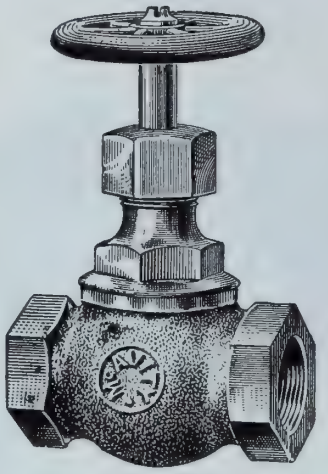
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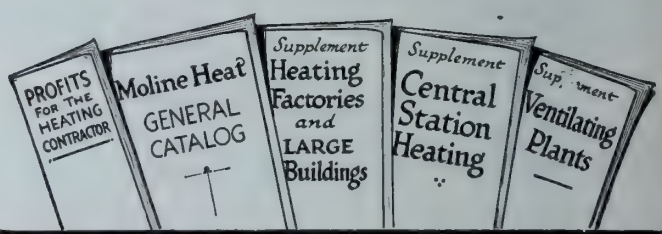
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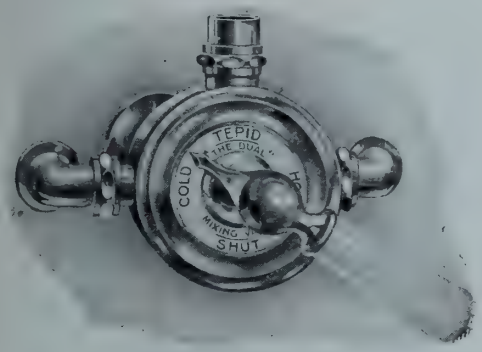
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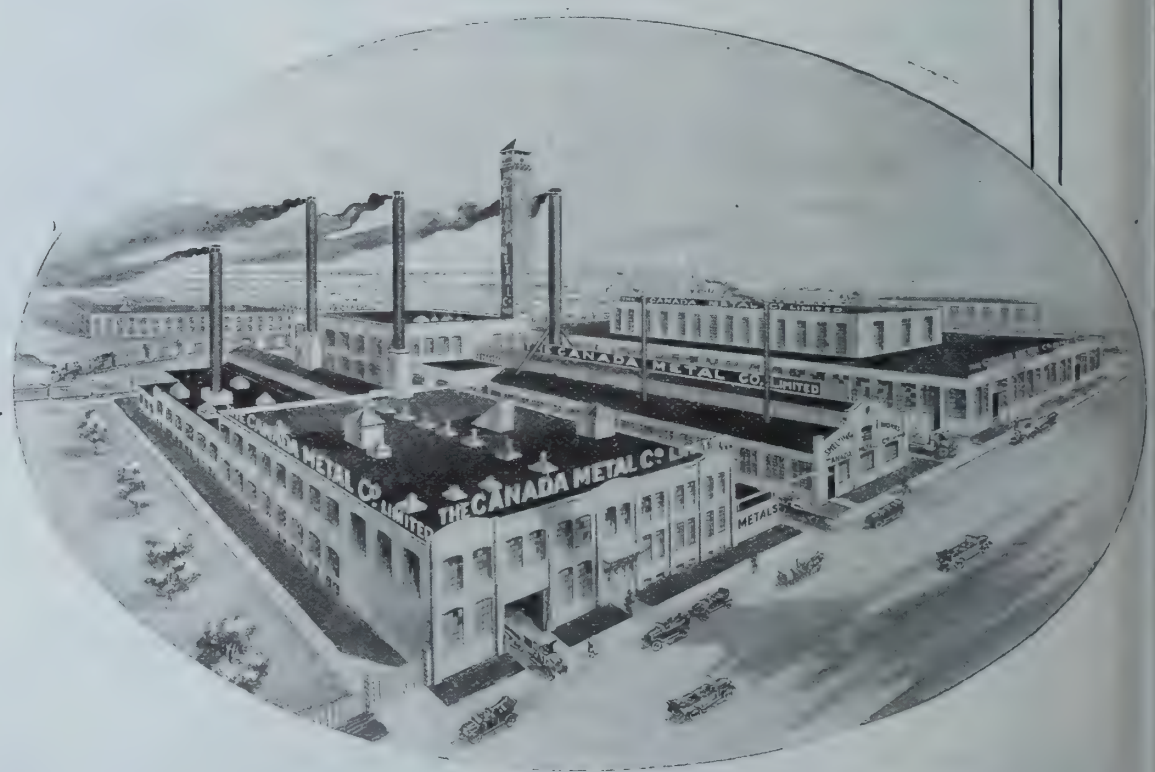
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Sheet Lead	Iron Pipe and Cuttings
Bath Tubs	All Brass Goods
Lavatories	All Ingot Metals
Sinks	

Write for Catalogue "A."

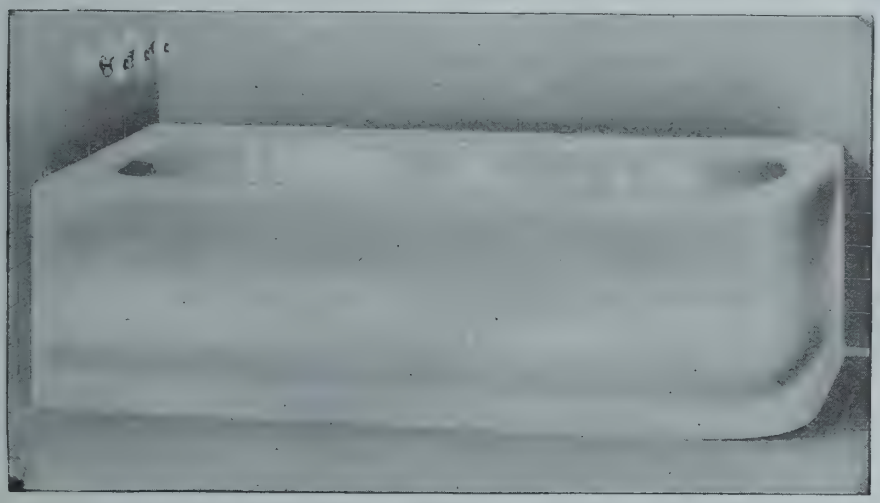


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Montreal:
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Made in Canada



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With this brand mean fittings made of Air Furnace Refined Iron, reamed and tapped to gauge with perfect threads.

Standard and Extra Heavy Flanged Fittings and Flanges. Galvanizing Malleable and Gray Iron Castings of all Kinds.

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Consideration will be shown to the first application from cities suitable for Dunham Service Stations, but we reserve the right to establish more than one station, each on equality basis, where conditions warrant more than one Station.

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SANITARY ENGINEER
PLUMBER AND STEAMFITTER OF CANADA

Vol. XII. TORONTO, JUNE 1, 1918 No. 11

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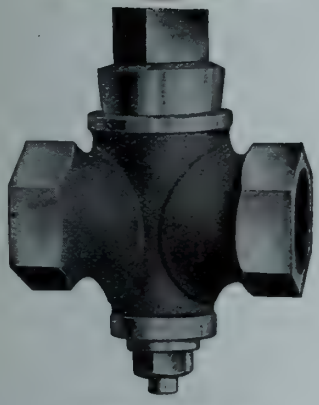
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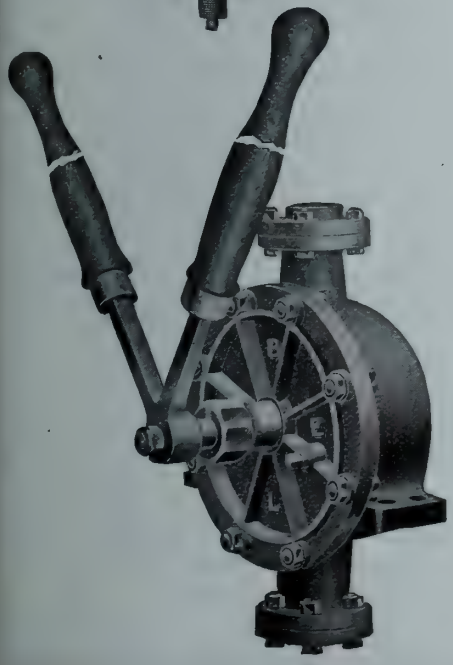
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Cornbrook, Manchester, England

It is our intention after the War to devote our energies to the intensive production of the following Specialities:

- Gunmetal and Brass Valves and Cocks.
- Steam, Water and Compressed Air Fittings generally.
- Cast Iron Stop and Sluice Valves.
- Semi-Rotary Pumps.
- Extruded Brass and Bronze Bars.
- Brass Bolts and Nuts, Studs and General Turned Work from the Bar
- Cast and Malleable Iron Cocks and Pipe Fittings.
- Pressure and Vacuum Gauges.
- Injectors, Engine Governors.
- Spraying Machinery.
- Coppersmiths' Work.
- "Stella" Brand Alloys, Manganese Copper, Silicon Copper, Ferro Zinc, Phosphor Copper and Tin, etc.

Business After the War

If you are interested in any or all of the lines mentioned and are in a position to take a hand in the energetic distribution of the same, please communicate with us NOW to our Head Office at the above address.

Building Bigger Business

From Self-Help Series No. 2

"We will all have to 'dig' for new business. The days when orders walk in the front door of our shops are over—we must go out and make orders. Co-operation between the trade and manufacturers to 'Hold the home lines' is just as vital as co-operation between the units in the army to hold the front lines. The man who formerly relied upon the advertising and salesmanship efforts of the manufacturer to bring his business to him must now add his own personal efforts to get business in order to stay in the game.

"The help in getting business which the manufacturer has always freely offered in the past will be even more freely given this year—but the man who is to benefit and get the actual order must be alive to the business opportunities of his own vicinity. He must grasp the hand of the manufacturers, go out early and late, and make two orders grow where one grew before."

The above extract is taken from a series of advertisements now being published in the leading periodicals in the United States, for the purpose of interesting manufacturers, jobbers and contracting plumbers in a combination which will have for its purpose the development of new business in those localities where conditions have not up to the present time permitted the use of sanitary conveniences, and in other localities where such fittings are now installed but which through age and constant use have become obsolete.

With the cessation of building operations these are the two fields from which we must get new business, and the extract is reprinted as it so succinctly states the conditions, and emphasizes the fact that in order to develop this business there must be a co-ordination of effort between all who are interested.

The suggestion is offered to the master plumber through our advertising space in the "Sanitary Engineer," with an undertaking that the PORT HOPE SANITARY MANUFACTURING COMPANY, LIMITED, will gladly enter into any similar arrangements which will introduce new business, or in the words of the extract—make two bath-rooms grow where there was only one before.

The services of this Company, its literature, cuts or advertising matter are always at the disposal of any progressive master plumber, and the Company will be glad to have the views of contractors on this subject.

Port Hope Sanitary Mfg. Co., Limited

Factory:
PORT HOPE, ONTARIO

Head Office:
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TORONTO SHOW ROOMS
119 King St. East

WINNIPEG OFFICE
405 Tribune Bldg.

MONTREAL SHOWROOMS
234 Beaver Hall Hill

SANITARY ENGINEER

VOL. XII JUNE 1, 1918 No. 11

Creating New Business

Methods Adopted by Enterprising Sanitary and Heating Engineers—How One of Our American Cousins Secured Sixty-seven Thousand Dollars' Worth of Repair Business in One Year by Adopting a Simple Idea

WE often hear it said that sanitary engineers and heating engineers can never hope to become business men like the average merchant and "seller of things." We often hear it remarked that a good mechanic never made a good salesman, and other statements to a similar effect. But what do we hear the average salesman say? He says to himself, "If I ever wish to become a successful salesman I must know the goods I sell, how they are made, their value in service to the buyer, how they are used, etc. In fact, I must know every point about them as well as their application."

The writer knows of scores of young fellows who, before going out on the road, have donned overalls and worked in the factory for as long as two or three years before they felt they knew all about the goods and were fitted to sell them. They realized that they must, as it were, become mechanics first and salesmen afterwards. So why should members of our profession take the stand they do in many cases and accept the erroneous view that a good mechanic can never hope to become a successful business man? There are, we know, thousands upon thousands who appear to be so absorbed in matters mechanical that they overlook the economic side.

Here is a true story of a drain digger He and his wife were discussing with the writer as to how it would be possible for a drain digger to ever be anything but a drain digger. With no skill and no ability required in drain digging, and with such limited education, there was absolutely no chance of bettering one's position.

The writer then said, "Well, what have you been doing to-day?" How many cubic feet of earth have you shovelled? What kind of material were you digging?" The man replied that he hadn't taken much notice of the work he had done. Then replied the writer, "You are not even as intelligent as a dead thing, at least you don't know any more about the job. Why cannot you take a small pocket book and a rule, make notes of the kind of material you dig, the amount you move in a day, the distance you have to throw it, and then calculate the amount of time expended in doing certain classes of digging. It was such observations that made the steam shovel. Comparisons were made and the manufacturer of a steam shovel will tell you how many men's time can be saved by using one of his shovels, and so on."

Now just try taking note of what you are doing and see if the work you are doing does not become more and more interesting. To-day that man is a large contractor, takes all manner of excavation work, and has several steam shovels. The moral is that we should first of all know our business and then be able to sell our labor and the goods we have to instal, and, to do this successfully we must make plans, carry them out, and know that we are being recompensed for so doing. Next is that we should create a demand for our goods and labor, and do so in as economical a way as possible.

Here are two plans almost similar to each other; one was described in SANITARY ENGINEER, December 15, 1914, issue. The man was given a job card as shown, and was expected to report in the right hand column the condition he found the various fixtures in the building. Of course the man reporting any work was given the job to do if he was in the employ of the same concern and was not otherwise busy on another job. When an order was received, whether by mail, phone or from any other source, at that moment it was immediately entered in the order book and given a number. A time and material sheet was made out as soon as the job was started, the sheet given the same number as the job, and everything was entered on this sheet, both time and material. If the apprentice was sent to the shop for anything for the job, it was entered on the time sheet, etc.

The best point in this sheet, however, was the column under heading "remarks." The workman was instructed to take note of the condition of the various fixtures. If the furnace happened to be in bad condition, he reported under heading, "What the conditions are," whether covered or not, as well as the piping. The same with the w.c., basin, sink any other part of the w.c., basin, sink or laundry tub. Then, when work seemed to be likely to run short, either the employer or foreman would make a call.

Job No. 65 Employee's No. 25 WILLIAM JONES, Sanitary and Heating Engineer

DATE	TIME	MATERIAL (No Material To Be Taken To Any Job Until It Is Entered On This Charge Sheet.)	REMARKS.
1914 June 10	3½ Hrs	4 ft ½ in Lead Water pipe 1½ lbs Solder 1 Pint Gasolene 4 Car Lichelo 2 ½ in pipe Straps	Condition of Furnace, Etc. Hot water not covered. Fire door broke, new smoke pipe wanted. W.C. Ball Cock leaking. Bath Copper lined in bad condition. Lavatory Marble slab Bowl Cock Sink Lapo leaking old Cast iron.
Thos Mathieff 65 Westbrook Rd Repair water pipe			

SHEET FIG. 1.

For instance, let us examine the sheet, Fig. 1, Job. No. 65. Employee No. 25. It will be seen how the material and time is charged, and under "remarks" it will be seen that the furnace was hot water, not covered, the ball cock leaking, etc. The same system could be carried out with every piece of plumbing or heating. Such information proved to be very valuable and a personal call was made later on. For instance, the employer or foreman called to see how the job was done, and at the same time to call the owner or householder's attention to the condition of the various appliances, and in nine cases out of ten some new business was procured. Even if not successful at the time, it was pointed out that as note had been taken of what would be necessary in case the owner or

householder desired at a later date to have the work done, the workman would be properly instructed what to do, and would bring material and tools on the first visit, thus saving time of sending or going back to the shop for them.

Over Sixty Thousand Dollars of Plumbing Jobs Sold by Follow-Up

The other method referred to is that of a concern of sanitary and heating engineers in the United States. This live member, acording to L. McNamara, president of the National Association of Master Plumbers, increased his business to the tune of sixty-seven thousand dollars by a similar system to that related above, except that our American cousin not only got his men to report conditions, etc, but he paid them a bonus. In describing the method adopted, Mr. McNamara said in the "Monthly Bulletin":

"One of our members in a small interior city (he is too modest to allow us to use his name) has just related the following story of his success in increasing his business sixty-seven thousand dollars in one year by using a report which he gets his plumbers and fitters to fill out and return with every job work slip that they turn in. The method is as follows:

"He gives his work slip to his plumber and sticks this additional report blank on the work slip. See report blank, Fig. 2. The plumber goes to the repair job and repairs the faucet or repairs the sink waste, or does one of the usual small jobs that the owner telephones into the office of the master plumber. On this kind of a job the master plumber rarely makes any inspection himself, and therefore does not see the condition of the plumbing in this house or building. The plumber, however, makes the necessary repair for which he had the order and does see the condition of the plumbing and the fixtures and the heating of the building.

"This is where the report blank comes in; the plumber for this particular master plumber fills out report blank, which you remember is attached to his work slip; he comes back to the shop and turns in this work slip, and the master plumber detaches the report and carefully notes the items thereon. At first this master plumber found that some few of his men were rather careless in making this report, and he succeeded in arousing their co-operation by giving them a dollar when the item on the report followed up by the master plumber's selling effort was turned into a job.

"The workmen became so enthusiastic that several men have earned one hundred to two hundred dollars a year more through the sales resulting from their reports, and the master plumber's business has been good. Right here we want to say we believe every member of our National Association should adopt this method, and we believe the results would be sufficient to keep all of your men as busy as they were last year if the reports are properly followed up by yourself."

PREMISE REPORT CARD

Notice to Employes

The success of this depends on you.

If you properly fill out this ticket it will give us a line on the needs of our customer. If we sell them, it means work for you. Let's pull together.

Date _____

Name _____

Street No. _____

KIND OF FIXTURES NOW IN USE

	Condition Good or Bad
Bath	
Shower	
Lavatory	
Closet	
Sink	
Laundry	
Method of Heating Water	
Bathroom Accessories	
Medicine Cabinet	
Vacuum Cleaner	

Plumber _____

HEATING REPORT

KIND NOW IN USE	Condition
Heating Boiler	
Heat Regulator	
Temp. Regulator	
Kind of Heat	
Radiator Shields	
Radiator Valves	
Air Valves	
Bathroom Accessories	
Garage Plumbing	
Medicine Cab	
Vacuum Cleaner	

Plumber or Fitter _____

Report Card to be filled in by employee.

Now, if readers of SANITARY ENGINEER will give just a little thought to those two ideas they will see more than the common mechanic's ability, they will find that it must have been practical salesmanship that worked out those ideas, and there is success for the mechanic with his training more so than for the salesman or merchant who lacks the mechanical or technical training. The secret to success in every business is salesmanship, and the secret to successful salesmanship is knowing your goods and studying the wants of other people. We do not know one industry that should be more successful than the sanitary and heating business, because the goods and the labor which are used are more necessary to the nation's welfare than those of any other line. Our labors are necessary in keeping our towns and cities sanitary. We are sanitarians of the highest order. It should therefore be the aim of every person engaged in the profession to do his level best to become a successful salesman, put into operation any or every scheme possible that will contribute towards making our localities more sanitary and better to live in because we chose that practical and necessary profession, sanitary and heating engineering. We should not be satisfied to conduct our business in a slipshod mannr, but make a success of our profession. Everybody loves a successful man, and sometimes the writer thinks that one reason why so few men in the sanitary and heating business are looked upon by the public with the respect they deserve is because so few are successful.

AMERICANS IN RUSSIA ASK FOR HELP

Here is a hint to publishers of Canadian trade and technical papers and business men generally.

In the vicinity of Moscow and Petrograd are several hundred American business men who are valiantly striving to impress the Russians with the size and importance of American industry. They need, so the American Ambassador reports, copies of good trade and technical papers. If agreeable, you are asked to mail two representative copies of your paper to Miss E. T. Weeks, Reference Division, Committee on Public Information, 6 Jackson Pl., Washington, D. C.

These papers will be forwarded in State Department pouches to Moscow and Petrograd. The Russians are literally hungry for this kind of information and the Committee on Public Information says these papers will have an important political effect as well as help pave the way for American trade relations.

Tests and Designs of Air Lift Pumps

The Air-Lift Pump Has Become One of the Most Economical Methods of Raising Water—The Simplicity of Construction and Almost Entire Absence of Moving Parts a Unique Feature

By A. W. Purchas*

THE subject of air-lift pumping has not received the attention it deserves from engineers, and has fallen into disrepute with many. There are several good reasons for this, among which may be mentioned the lack of a satisfactory theory, the low efficiency of most installations, and the lack of complete and accurate reports of tests, so that the causes of the low efficiency are obscured.

An attempt is made in this paper to rectify the first, to show how the second can be improved, and to point out in what respects many reports of tests are lacking in information essential to a thorough analysis for checking theoretical formulae and deductions.

An account is given of several series of tests, with a description of the methods and the equipment. The theory of the pump is then reviewed, and a novel method of approaching the subject is given, from which it should be possible to evolve rational formulae for designing.

Equipment and Methods for Testing

General.—The wells on which these tests were made form part of a water supply system, of which an account was presented to the Institution of Civil Engineers some time ago. Series A of tests was given at that time, but further investigation showed that the author had wrongly calculated the actual volume of air used, and the average velocities of the rising mixtures in the eduction-pipe. By their kind permission, it is possible to reproduce these test figures with the errors corrected, and other valuable deductions added.

On pulling the eduction-pipes from the wells, after they had been in operation for some length of time, the interior surfaces were found to be heavily encrusted with nodules of rust, some ⅜-inch high, of such rugged outline as to leave no trace of smooth contour on the surface of the pipe. The tests of Series A are of one eduction-pipe when newly installed, and the tests of series B are of the same pipe when encrusted as described above. A comparison of these two series shows some very interesting points, Fig. 9. The eduction-pipe used in the tests of series C was badly encrusted, but that of series D was clean.

Air-Injection Foot-Pieces.—The foot-pieces used in the various tests are shown:—

For Series A in Fig. 1
For Series B in Fig. 1A
For Series C in Fig. 2 and 2A
For Series D in Fig. 3

The merits and faults of these are discussed later under the theory of the pump (page 13).

*Read before the Institute of Electrical Engineers, November, 1917.

Lift

In series A and B this was measured by lowering a float on the end of a steel-tape line between the eduction-pipe and the well-casing. The float was a piece of wood ¼ inch by 1 inch in section, and 6 feet long, weighted to float upright with about 5 feet submerged. This method, however, is not recommended, as the float will sometimes become wedged between the pipe-couplings.

In series C and D the lift was measured with the device shown in Fig. 4. This consists of a piece of heavy brass-pipe, inside which a small copper-float is free to slide at the least impulse. The whole is suspended by a duplex rubber-covered cable, graduated in feet, one wire of which is connected to the case, and the other terminating in a lump of solder on the lower side of the insulator, which forms the top of the case. At the top of the well an electric bell and batteries completed the installation. The case was lowered into the well, and its reaching the water surface was indicated by the bell at the ground surface ringing. By this means it is possible to measure the depth to the water surface within an inch. It is absolutely impossible to estimate correctly the lift from the gauge-pressure of the air at the well-head, and this should never be attempted. Some injection foot-pieces put from 5 to 10 lb. per square inch extra pressure on the air, and there sometimes is a loss of 5 lb. pressure due to friction in the air-pipe. A combination of these losses might make an error of 30 feet in the estimated lift. To estimate the lift from the air-pressure required to start the well flowing is equally impossible since, once the well is started, the lift nearly always increases. Reference to tests 1, 2 and 3 of series D, among others, shows that under certain conditions the air-pressure at the well-head may be less than that equivalent to the submersion head of the foot-piece. This may be accounted for by noting that a column 600 feet high of air under 135 lb. per square inch pressure will exert an additional pressure on the base of a column of 3.25 lb. per square inch, due to its weight.

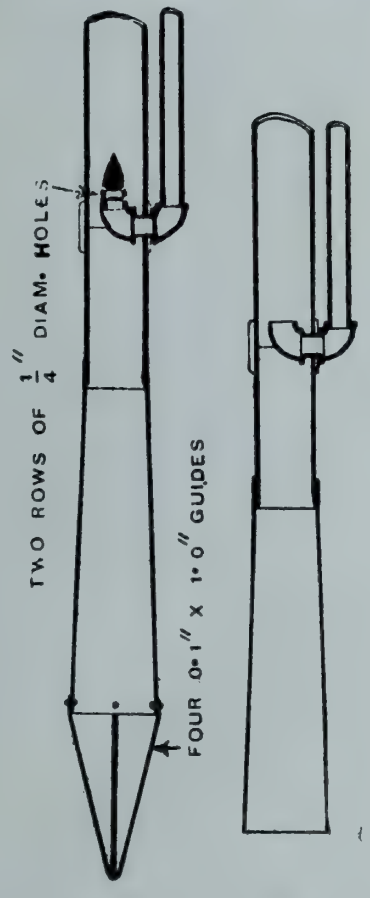


FIG. 1, SERIES A.

FIG. 1a, SERIES B.

An alternative method of measuring the lift is recorded by Mr. Kenneth Allen in a paper read before the Engineers' Club, of Baltimore (in 1908, on the wells at Atlantic City, U.S.A.

Air-Compressor and Measurements of Air Used

The air-compressor is a two-stage, with both air and steam cylinders compounded. The sizes of the more important parts are as follows:

	Inches
Diameter of the air-cylinders	10 and 18½
Diameter of the steam-cylinders....	12 and 22
Stroke of all pistons	18

The air is drawn through a combined forecooler and filter outside and on the shady side of the building, and passes through an intercooler between the two air-cylinders. The cooling water is circulated by a double-acting piston pump of 5½ inches bore, and 5 inches stroke, driven direct from the crank-shaft of the compressor. The suction valves of the low-pressure cylinder are semi-rotary, and are mechanically opened and closed by an eccentric on the main crank-shaft. All other air-valves are automatic, spring loaded and air-cushioned.

Many tests, which would otherwise be of the greatest value to the designer, are rendered of only doubtful value because the volume of air used was not carefully measured; hence the average velocities of the rising mixture can only be approximated. These velocities are the most important items affecting the efficiency of the pump, and those on which more than any other accurate data are required at the present time.

It is found in checking the published figures from too many tests that the volume of air used was calculated from the known displacement of the low-pres-

sure piston of an air-compressor allowing volumetric efficiencies of 95 per cent. and 97 per cent. Considering the types of compressors used, these figures are impossible, and are based on lineal measurements from indicator diagram on the assumption—unjustified by experiment—that the temperature at the beginning of compression is the same as that of the air at the intake.



FIG. 2a, SERIES C.

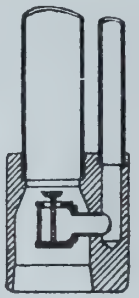


FIG. 2.

The true volumetric efficiency of a compressor based on the ratio of air drawn in at atmospheric pressure and temperature to the displacement of the low-pressure piston will vary:

For single-stage compressors, from..... 50-70%
For two-stage compressors, from..... 60-80%
For three or more stage compressors, from 80-95%

The above figures are taken at random from various sources, and it is impossible to state average values.

Returning to the tests here recorded, prior to each series the air-valves of the compressor were examined, and their seats put into good condition. On 25th and 26th April, 1914, tests were made of the volumetric efficiency of the compressor, and again on 7th and 8th May, at the end of each test of the air-lift pump. The discharge from the compressor was measured by means of an orifice, the form of which and the method of connexion to the air-receiver are shown in Fig. 5. This meter is a duplicate of that used by Professor R. J. Durley, of McGill University, Montreal, to determine the coefficients of the discharge or air through certain forms of orifice. An account of his work is to be found in the Transactions of the American Society of Mechanical Engineers, vol. 27.

The formula given in the above paper for calculating the flow through the orifice, is:

$$Q = 0.6299 \ Cd^2 \sqrt{\frac{i}{T}},$$

in which—

Q is the weight of air passing through the orifice in pounds per second.

C is the coefficient determined by experiment.

d is the diameter of the orifice in inches.

i is the pressure inside the meter-box in inches of water.

T is the absolute temperature F. inside the meter-box.

This formula only applies to sea level, so as the plant at Oilfields is 700 feet above, the following formula was used to compute the discharge:

$$Q = 0.1632 \ Cd^2 \sqrt{\frac{i}{T}} P^a$$

P^a is the absolute pressure in pounds per square inch of the air inside the meter-box. This equals the barometric pressure, plus 0.036 i.

For testing air-lift pumps, it is probably more convenient to install a meter in the air line between the compressor and the well. This is more expensive to install, but the volumetric efficiency of a compressor is a very variable quantity, which cannot otherwise be measured during the tests of the well-pump. Such a meter is shown in Fig. 6. The principle is identical with the foregoing, and the same coefficients of discharge

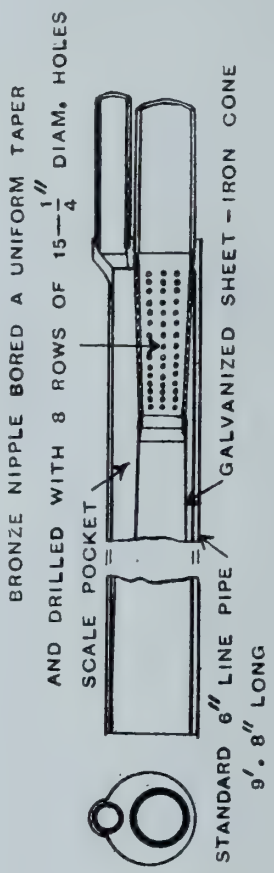


FIG. 3, SERIES D.

may be presumed to apply, if the velocity of approach and the head be maintained within the limits tested by Professor Durley. In this meter the discharge will be found by means of the formula:

$$Q = 0.1632 \ Cd^2 \sqrt{\frac{i}{T}} p,$$

in which—

i is the difference of pressure on the two sides of the orifice, measured in inches of water.

p is the average of the absolute pressures of the air on the two sides of the orifice.

From the foregoing formulae, the volume of air is found by the formula:

$$W = \frac{p}{53.17 \ t},$$

in which—

W is the weight in pounds per cubic foot.

p is the absolute pressure in pounds per square foot.

t is the absolute temperature F.

A third and similar method of measuring the volume of air is possible through the research of Professor William Watson and Mr. Herbert Schofield, who determined the coefficient of orifice placed in the suction-pipe of a compressor.

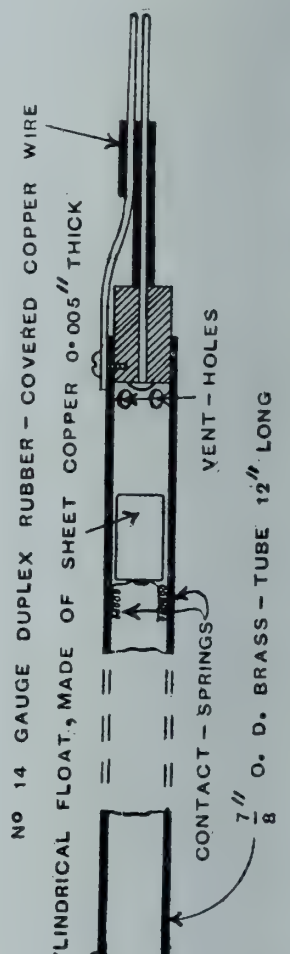


FIG. 4. APPARATUS FOR MEASURING LIFT.

Quantity of Water Raised

The discharge-pipes of the wells at Oilfields rise about twenty feet above the ground, and discharge over the rims of small tanks, against curved hoods which deflect the water downwards. The pipes are bent to gradual curves, and the last few feet are inclined about 70 degrees to the vertical. Permanent derricks of a light California oil-well pattern are built over the wells, and were the discharge-tanks erected vertically over the wells, they would have to be removed each time the eduction-pipes were pulled. From these small tanks the water gravitates through 6-inch mains, laid along an overhead platform,

to two 84,000 gallon corrugated galvanized iron tanks and one wooden tank of like capacity. The iron tanks average 32 feet 9 inches in diameter, and 13 feet 4 inches in depth. The circumference of each ring of these tanks was carefully measured and checked, also the depth of the corrugations and the thickness of the plates. These measurements were taken when the tanks were full to the level at which the measurements were being taken, and from these figures a table of capacities was prepared for each eighth of an inch of depth.

Prior to each test, the well was pumped for sufficient time to allow all conditions to become constant, and the water meanwhile delivered into one tank. At the commencement of the test the water was diverted into another tank and switched back into the first again at the end of the test. All outlets from this measuring tank were closed and under observation at all times during the test.

Such facilities for measuring the quantity of water are rarely available, but there are several alternatives, such as weirs or Venturi tubes, which give equally accurate results. Many tests record only the combined performance of two or more wells; this is unfortunate both from the owner's point of view, and from that of engineers, as the information is too general; the extra cost of individual meters for each would undoubtedly be justified by showing some chance of improvement in the efficiency of one or more of the wells.

One writer who has contributed the results of some very instructive tests, measured the quantity of water pumped in a reservoir, the size of which unfortunately would only permit of runs of ten minutes' duration. It is the author's opinion that no test of an air-lift pump should be of less than one hour's duration, and that it is better to run this length of time and measure the water with some form of calibrated meter, than to run shorter tests and measure the water in any other way.

Indicated Horse-Power of Compressor-Air Cylinders

For this purpose an external spring Tabor indicator was used. This instrument had seen but little use, and was in perfect condition throughout. Great care was exercised throughout the tests to obtain true representations of what was taking place inside the cylinders. The revolutions of the compressor were recorded by an Ashcroft counter, and were controlled by a steam throttle-governor, which was operated by the variation of both the speed of the engine and the pressure of the air in the receiver.

Nature of the Discharge from the Wells

These observations were taken by two observers for three periods of five minutes each during each test. Where the discharge was 50 per cent. or more of the total cycle, the intervals were remarkably constant. The values here given are averages of times observed with an ordinary watch:

Series A.—These observations were recorded in the paper presented to the Institution of Civil Engineers, and are therefore not repeated.

Series B—

Test 1. Periods of discharge of thirty-five seconds' duration at intervals of one minute and twelve seconds.

Test 2.—Periods of discharge of forty-three seconds' duration, followed by a pause of five seconds, then a discharge of perhaps ten gallons, followed by a pause of thirty-three seconds before the cycle recommenced.

Test 3. A steady flow of emulsion ending in two short and violent ejections, the whole lasting thirty-three seconds. After a pause of five seconds, there would be a discharge of ten to twenty gallons, followed by a pause of twenty-eight seconds before the cycle recommenced.

Test 4. Periods of discharge of thirty-three seconds' duration at intervals of twenty-three seconds. During the interval there would be one fairly strong spurt lasting one second.

Test 5. Periods of discharge of one second at half-second intervals.

Tests 6, 7 and 8. Discharge similar to that of Test 5, but at higher velocities.

In all cases the discharge consisted of an emulsion of air and water, and not of alternate volumes of air and water, as Dr. Pohle claimed for his system.

Series C—

Test 1. Periods of discharge of forty-two seconds' duration at intervals of two minutes and seven seconds.

Test 2. Periods of discharge of thirty-six seconds' duration at intervals of fifty seconds.

Test 3. Periods of discharge of forty-one seconds' duration at intervals of twenty-six seconds.

Test 4. Periods of discharge of two to four seconds' duration at intervals of two to five seconds. Very irregular.

Test 5. Very similar to that of Test 4.

Test 6. Similar to Tests 4 and 5, but the intervals did not exceed half a second.

Tests 7 and 8. Very similar to Test 6.

Series D—

Test 1. Periods of discharge of forty seconds' duration at intervals of fifty-two seconds. During these intervals, however, there were five discharges of one to ten gallons each.

Test 2. Periods of discharge of five seconds' duration at intervals of five seconds.

Test 3. Periods of discharge from five to ten seconds' duration at intervals of five seconds.

Test 4. Periods of discharge of short duration, one beginning before the previous one had quite subsided. The velocity of discharge did not appear to be as high as in Tests 2 and 3.

Test 5. Similar in nature to that during Test 4, but at higher velocity.

Tests 6, 7 and 8. Practically continuous discharge of emulsion of small air bubbles and water.

(To be continued.)

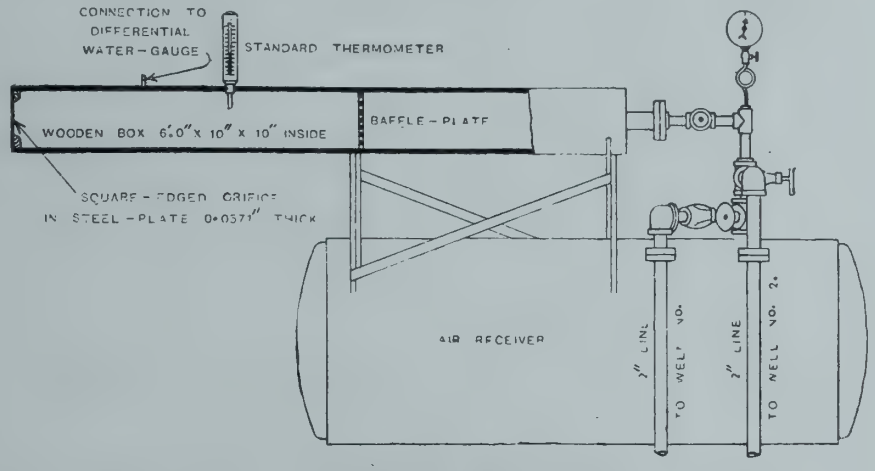


FIG. 5. ORIFICE METHOD FOR MEASURING THE VOLUMETRIC EFFICIENCY OF A LOCOMOTIVE AIR COMPRESSOR.

MOVED TO NEW ADDRESS

W. H. Cunningham, manufacturers' agent of 98 Kingswood road, wishes to thank the trade for the way they have patronized him by asking their jobbers for the goods he is handling. So much so that he has had to acquire an office and warehouse in the centre of the city. His new address is 183 Church street, Toronto. The following are a few concerns which Mr. Cunningham represents: A. B. Jardine Co., Hespeler, Ont.; Ford Porcelain Co., Perth, Amboy; Simplex Mfg. Co., Chicago; Hotstream Heater Co., Cleveland; Rolf Heater Co., Columbus, O.; Galt Brass Co., Galt, Ont., and a number of other well known concerns in Canada and the United States.

RATHER RISKY

If they are not careful some otherwise perfectly good German soldiers are going to get hurt, fooling around in front of our boys in the trenches the way they do.

WANTED--A GAS BY-LAW

There have been twenty-two gas-poisoning fatalities in Toronto since the 1st of January. The slaughter should be investigated thoroughly by a group of experts so that some adequate remedy may be applied.

THERE does not seem to be much use talking gas fatalities, and much less use carrying on investigations, when as a matter of fact there are concrete reasons for each and every one of the fatalities recently recorded, of deaths or injuries from gas poisoning. Almost any member of the trade could at least give methods by which every accidental case could be eliminated.

Here are a few reasons by which these accidents could be eliminated if there existed a practical gas by-law:

1. No rubber hose connections.
2. No 15c gas cocks.
3. No 15c gas burners.
4. No "Fixing your own gas stove."
5. No cheaply gotten up gas appliances.
6. No gas service turned on if piping is not properly inspected and tested by a practical man.
7. All piping plans and sizes to be practical in every detail.

But, oh, what do we hear? Some nonsensical alderman is declaring that we are "Inspected to death." Well, which appears to be the healthiest, "Gassed to death or inspected?" We leave that question to be answered by the alderman who appears to uphold the manufacturer and dispenser of junk, which is the 15c and cheap-jack hardware man, the departmental and other stores whose wares are all made to "sell" the public.

The average citizen cannot be expected to know the difference between a gas cock selling at 15c and one at 50c; and many who have bought the 15c junk never will know now they're "gassed" and gone. Let's get together and work on a gas by-law, and see that none but practical men are employed and practical and safe appliances are installed.

How to Sell Stationary Vacuum Cleaners

Some Reasons Why the Trade Should Increase Their Business by Selling Stationary Machines—How to Sell and Why—Extract From an Article by a Late Master Salesman

By One of Us

NO man ever successfully made love when he had a cold in the head. Also, no man ever devised a great business scheme when he had asthma.

Adenoids, enlarged tonsils, defective hearing, myopia, often come from bad sanitary conditions that weaken the individual, until the germs of disease get him in their despotic clutch.

Appendicitis follows faulty circulation, imperfect elimination, impaction.

Then come congestion, inflammation, and a condition is ripe where the surgeon's knife is a necessity in order to save the life of the patent. No physician of skill will dispute these simple propositions.

The Fresh-Air Cure

The air is the life. We can go without drinking water for six days. We can go without eating for forty days. But we can not go without breathing for four minutes.

We eat our peck of dirt all right, and then go on and eat another; but we can not breathe a peck of dirt without stopping up lung-cells; and then folloss a condition where the blood is imperfectly oxygenated. Faulty elimination results. The germs of tuberculosis jump the claim, and the toxins that these "tubercs" produce poison the wellsprings of life, and we get what the people in Colorado call a "lunger."

It is only within recent times that we have recognized the necessity of fresh air. Sleeping out of doors in open-air sleeping porches will add 20 per cent. of efficiency to the life of the individual.

To be strong, well, happy and efficient, we must be hygienic in our habits.

Soap, water and sanitary plumbing are now accepted, but poisoned air in the homes means toxins in the bodies of the occupants—then disease.

All disease is indecent. Only healthy people are lovely and lovable.

A Wholesome Environment

Sweeping with a broom and dusting are very crude, laborious and primitive operations. A broom is a "brush," and a brush is just a bunch of brush tied round with a strip of slippery-elm or hickory-bark. This brush for sweeping was all right when people lived mostly out of doors, but for a modern home it is barbarous.

Distributing the dust and dirt in the air so it settles, and then where the furniture has to be wiped off by hand is a very faulty method.

Besides, the dust that falls on the furniture is the dust that falls on the floor, or on the carpet, or on the hangings, or creeps into the crevices, or which is, in large degree, breathed into the lungs by the human system.

These things mean that we absorb the germs of disease and weaken our constitutions until we get ripe for the ethercone, the surgeon and the undertaker.

There is one way to keep your house sweet and wholesome, and that is to pick up the dirt by the suction process. Sweeping the brooms simply distributes the dirt and dust, so the sweeper and the family can conveniently breathe it in.

The whisk-broom, the dusting-cloth, the feather duster, or a broom of any sort belong to pioneer times.

Carpet-sweepers are only a slight improvement.

No home-maker wants particles of dust in her rugs, on the floor, in the curtains and hangings of her house.

The particles of dust and dirt, with their boon companions, microbes, are brought into the house by every person who enters, by the breeze and even with the flowers. Then they go into partnership with minute particules of decaying food, and we get a "condition."

The dreaded second year of the child is dangerous owing to the fact that a good deal of little Cherub's time is spent on the carpet or the floor. A child carried in arms is freed to a great degree from the germs of disease. But when the little darling begins to creep he is right down amongst the bugs, the bacteria and the carbonic-acid gas.

Measles, whooping-cough, croup, chicken-pox, are all avoidable diseases. Once we thought they were all sent by Providence. Then we said they were unavoidable. Now we know that all disease has a cause, and if we can sidestep the cause we elude the disease.

You can not keep your child off the floor. He has to exercise—to creep, to crawl, to climp, to pull himself up by a chair. He is investigating his environment.

What shall we do? Why, we will make the environment wholesome; and there is only one way to do it, and that is to keep the floor clean, free from the destroying, disintegrating and death-dealing bugs, bacteria and microbes. We certainly would not pick up the imprities of the street and put them on our plates at the table. But we do pick them up and carry them into the home by the millions.

Now, the question may be raised as to how money can be saved if stationary cleaners are installed in every home. In the first place, no house should be inhabited that is not made as sanitary as possible, and no home is as sanitary as it can be made if a stationary cleaner is not installed, and the least that can be done is to have every house piped in readiness for one.

It may be argued that a portable vacuum cleaner is all that be desired, and that almost every housewife has one; that one of these portables can be procured for about $40, whereas a stationary cleaner would cost in the neighborhood of $175 to $200, etc.

That may be all very well, but it has to be proved yet that a portable cleaner is any more sanitary than a broom. No doubt it is less laborious to use than a broom, but what about the bacteria which escape through the bag and are, in fact, made lighter and more liable to be breathed than if these germs were still adhering to the dust particles.

Then, again, when a portable cleaner is in operation the same air is being used, and no ventilation is being set up, as is the case when a stationary cleaner is used. Then there is the wear and tear of a portable, and even the first cost. How many persons are there who can afford to pay $40 to $50 for a "portable?" They are no doubt doing so, but that does not prove anything. For example, all motors are not the same current. Many a person has bought a "portable," and it has been in use for one year, when they had to move to another town or location, to find that there was a change of current, etc.

Next, look at the repairs. Very few portables are there that do not cost from 5 to 10 per cent. for repairs, and the average total life of such a machine is only about five years, and it has its limitations in usefulness. So that from even an economical standpoint the portable machine is not as expensive at first cost, but it does cost $10 to $12 per year; figure it out any way you like, and as before asserted, its usefulness is very limited.

In the olden days it was thought that to have running water in a house was a luxury; to-day it is necessity, and was in those days too, but the people did not realize the fact. No home or even office or factory building should be erected that is not equipped with a stationary vacuum cleaner, and it is not a liability, as is the case with a portable cleaner; and the up-to-date owner should be shown the big advantages a house has when a stationary cleaner is installed.

The next best course to follow when a person is building is to have the walls piped and have suction outlets fitted in the baseboard, so that if at a later date a machine is bought the house is already piped and no walls, floors or baseboards would have to be disfigured.

A real estate man the other day told the writer of a case where a house was

(Continued on page 30.)

The Cultivation of Efficiency

Showing That the Manufacturers of Plumbing Supplies Are Not Backward in Co-operating With Their Employees in Creating a Soundly Efficient and Pleasing Atmosphere in Their Surroundings, Making Work a Pleasure, and Pleasure a Paying Proposition

By J. H. MacMillan

LOOK backwards a matter of a very few years and consider the working environment of the factory employee. In ninety-nine cases out of a hundred the employer had no interest in "Jim Smith" or "Mary Jones" other than procuring from them a day's work for a day's wages paid. Sanitation was practically confined to hospitals, and the very word was suggestive of the doctor.

Slowly, but just as surely, the manufacturers have been brought to the realization that, in order to obtain one hundred cent on the dollar paid to the employee that consideration had to be given to the mental and physical condition of the human unit of their organization.

Factory construction was the first item that showed the trend of affairs. Daylight buildings of concrete and steel and a maximum of window space appeared. Texas" and "Saw-Tooth" roofs put in an appearance. Where a board-walk alley had previously been considered sufficient for a passageway between buildings, roadways of full width, cement paved, sprung into view. Hot and cold air systems for mechanically and automatically washing and freshening the atmosphere were added. Sanitary drinking fountains displaced the old germ-laden community drinking cup and dust-laden water barrels. Individual towels, laundered by the company relegated the "wipe" or roller towel to the background, and light, airy toilet rooms took the place of the disreputable foul-odored corners that housed the sanitation facilities (?) of the manufactory of not so long ago. Doctors are employed and paid for by the company to regularly examine those whose duties entail the slightest opportunity for contracting a disorder.

All this, and much more, has taken place to guard the physical welfare of our muscle power.



Then the factory owner even went a step further. Based on the fact that a sick brain is only a small percentage efficient, means of recreation came into being; means to lift the mental power of the human unit away from the daily task in order that the operating functions of that power should be become stagnant by being overfed with the monotony of the day's labor. Club rooms were furnished for the men and women, and from them have grown the spacious rest and recreation buildings that to-day provide the human element of an organization with mental stimulus to render 100 per cent. efficiency at the daily task. All of this is based on the old proverb of "all work and no play," etc.

When you stop to consider that the average employee spends a good deal more time at work than he does at play and at home combined—if you deduct the sleeping hours—it is not any more than fair that his place of employment should be as pleasant as possible.

For many years the various factories and branches of the H. Mueller Mfg. Co., Ltd., manufacturers of water plumbing and gas brass goods, etc., have been carrying out these ideas. To say they are costly is incorrect. The results that accrue more than equalize and justify the cost and upkeep of the institution.

The illustrations presented herewith show, conclusively, the lengths to which the Mueller Company has gone in their Sarnia plant. The plants at Port Huron, Michigan and Decatur, Illinois are equipped likewise. The consensus of the Mueller employees' opinions is the proof conclusive as to the success of welfare work. This work has a moral effect that is alone worth the value of the investment.

The Mueller Company employees have several internal associations, officered and operated by the employees themselves. Foremens' clubs, departmental clubs, etc., an employees' aid society, supported by nominal fees, disburses sick, accident and death benefits. The company itself is back of and supports both morally and monetarily any meritorious, welfare movement that is advanced. Hot tea and coffee is served gratis to each employee at meal times in the recreation building and music is provided and dancing permitted following the meal. Prizes are continually offered for effort along various lines, and co-operation rules in every angle of the big organization.

The writer of this article remembers, some twenty-five years ago, working in a broom factory for one dollar per week. That factory was one of the largest in the business at the time. Every available foot of space was crammed with material and stock at all times. Daylight was at a premium, and fresh air almost unknown. We had a clean-up day every second week for which we didn't get paid—Sunday morning. Anybody caught sweeping the floor around his bench at any other time was fired—with a capital "F." Sometimes the refuse from the broom corn (partially decayed field mice, too, included) was knee high at my bench—I was a "hurl cutter." More than once my stomach revolted and that too, would have to lay. We were positively not allowed to leave our benches except when the whistle blew. Slave-driving methods constituted efficiency of those days. When we contrast conditions such as they were with the modern factory of to-day, we can be excused from wondering how the worker stood his job under the conditions of not so long ago.

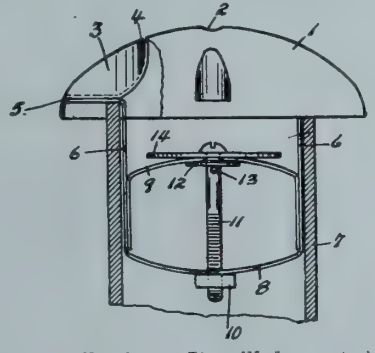
There are numerous industries of to-day that have not as yet "seen the light," but they are few and far between. The average factory employee of to-day is the best-cared-for individual in the commercial world—and why not? The human unit is fundamentally necessary to the operation of any industry. We must oil and repair our steeds of steel and fabric; why should be neglect to apply the mental and moral lubricant to our muscle power?

New Sanitary and Heating Goods

NEW VENT CAP

Of all improvements made for a good many years, no one appears to have attempted to improve the vent cap until recently, when Jos. M. Schrems, of Saginaw, Michigan, took out a patent for a new invention in a steel-pressed type of cap. The accompanying sketch shows some of the chief points in its favor.

The inventor claims that it is much more rigid when attached to a pipe terminal or breather than is the case with those which depend upon a set screw, etc. The vent cap is described as being made of 18 gauge metal pressed into form, and will fit either medium or extra



heavy soil pipe. It will be noted that four depressions are made in the top of the cap to form supports and bearing for same, so that the clamping device is only needed to hold it in position on the pipe and lock it in place.

A very slight turn or two with a screwdriver will tighten the expanding member shown in the interior of the pipe and will cause said member to grip the sides of the pipe and hold same firmly in position. Further information can be procured by writing to the inventor at the City Hall, Saginaw, Michigan.

WATER HEATERS FOR RURAL HOMES

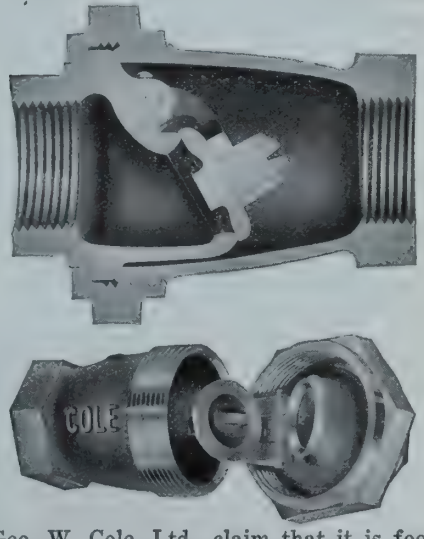
Realizing that when a farmer or rural resident requires hot water, there was nothing for it but to set the kitchen range fire on and particularly when plumbing has been installed, the Hotstream Heater Company, Cleveland, went to it and invented a new burner that will safely and efficiently burn kerosene or gasoline instead of the regular artificial or natural gas. A new booklet has been published describing the line of heaters made by this company and the heater referred to is shown on page 11. Several novel claims are made for this type of water



heater. Further particulars may be procured from the head office or the Canadian representative, W. H. Cunningham, 183 Church street, Toronto.

A NEW CHECK VALVE

One of the most recent inventions to be put on the market is that of a new type of union check valve. It is swing in action but can be used as either a vertical or horizontal check. The manufacturers,



Geo. W. Cole, Ltd., claim that it is fool proof, positive in operation and durable. It is all red brass and made in several sizes, and accurately threaded for pipe sizes of standard threads. Further particulars may be procured from the above firm at 2002 Dundas street west, Toronto.

Toronto Society Doings

The Question of Securing the Public's Good-Will is Becoming a Popular Subject—Investigation Committee and Chairman Appointed

THERE was a very appreciable gathering of members of the Toronto Society of Domestic Sanitary and Heating Engineers at their regular meeting held recently. The question of securing the public's goodwill, and endeavoring to give a square deal to all and sundry, was discussed from every angle.

Mr. Roy E. Belyea was called upon to address the meeting and was asked also to get in touch with the daily press in connection with the matter. To show that Mr. Belyea has already got started, and that the Toronto daily papers are in sympathy with the movement, the following news item appeared in a number of them under date of May 28:

OFFENDED AT RUMORS
Sanitary and Heating Engineers Take Action

"At the last regular meeting of the Toronto branch of the Ontario Society of Domestic Sanitary and Heating Engineers, the members' attention being drawn to the fact that slanderous statements against plumbers were made by public men and others, Mr. Edwin Newsome, editor of SANITARY AND HEATING ENGINEER, and Mr. Roy E. Belyea stated that until some action was taken to investigate all statements tending to bring the trade into disrepute, the latter would continue to receive the same unwarranted abuse as in the past.

"A motion was carried unanimously that a permanent committee be appointed to investigate all charges detrimental to the trade and to single out for public censure any member guilty of abusing public confidence or doing work contrary to the public welfare. It was pointed out that the master plumbers were anxious that the public's good-will toward them should not be alienated by statements of irresponsible parties."

In addressing the meeting, Mr. Belyea said:

"Most Toronto plumbers desire nothing, if not honorable financial success. That sounds different from robber plumber, does it not? Nevertheless it is true.

"I believe the Toronto members of our society have come to realize the larger the amount and the finer the quality of actual thought put into any venture in the general run of business, the surer and better the result and success. No sort of human effort demands more downright power of intelligent mind than business.

"The test of our success in the matter of 'collective advertising' and public good will, will be the amount and kind of effort which we can voluntarily hold good during our business career.

"Some people are not susceptible to inspiration to any purpose. Not often, however, is this discovery made. The majority of those with whom you come in contact can be influenced to energetic activity if you employ the right methods. You must of course, set the example, for energy, cannot make inertia captain. And interest is the inspirer, the director and the maintainer of life. You must awaken the feeling in others that activity and achievement are worth their while.

"It is therefore the duty of the committee appointed by the Toronto Society to become acquainted with all details connected with the undertaking proposed, and with reasons for one method of procedure or another. That this will be done the chairman wishes to assure the members. A review of the personnel of the committee is only needed to awaken the confidence of the members, as the chairman believes that he is connected with a lot of live wires who carry a high voltage of enthusiasm for the scheme in hand. They are as follows:—Mr. J. Lillie, of Hearn & Lillie; Mr. Allison, Jr., Yonge St.; Mr. J. Hall, of Hall & Co.; Mr. E. Louis Legrow, the cautious and fatherly member of the committee; Mr. Hillier, the well known east end plumber, and myself. These men are to act as the power plant and are expected to start the big dynamo of the association which in turn will carry on the campaign for public good will.

"As the scheme is still in the embryo but very healthy indeed, the chairman will hold all information at present collected till a more opportune time, when he hopes to be able to electrify the craft of Canada in such a way that they shall rest no more till the object set out to achieve is gained.

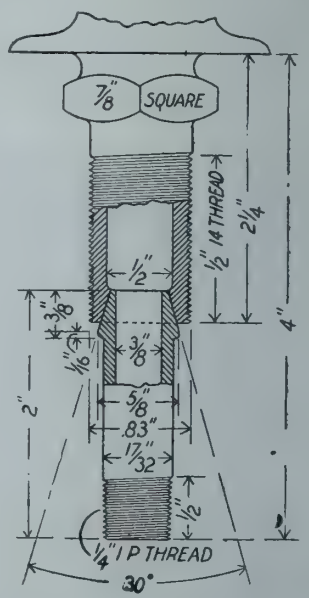
"To show that sanitary engineers of Toronto at least are in earnest to secure the public good will, I might state that at the last regular meeting, which had a representative gathering of the craft, a motion was passed appointing a permanent committee whose duty it shall be to investigate promptly all statements tending to bring the trade into disrepute, whether made by public men or others, and to set before the public the facts of any case in its true light and to single out for censure any member of the craft guilty of abusing public confidence. So, Mr. Member, who does not attend regularly, you will find it to your benefit to be present at all meetings, when at all possible. Your money in dues will not suffice to keep your interest guarded, but your presence is much desired. However, don't fail to be at the next meeting as the writer and others believe that a great attack is about to be launched against the prejudice of the trade.

"I might add on closing that to Mr. Edwin Newsome, Editor of SANITARY AND HEATING ENGINEER, belongs a large amount of credit for the manner in which he has worked in the awakening of the craft from its lethargy to its benefit at this time. That every member of the trade should support their trade journals is the contention of all thinking members of the craft, as it is very often through them that we receive benefit knowledge."

A STANDARD SHANK AND TAIL PIECE

It is quite evident that the manufacturers of brass goods over the line have finally solved one of the most troublesome experiences the trade has ever been confronted with, viz., that of tail pieces that would not interchange with one another.

The accompanying sketch is a reproduction of a blue print of the standard basin cock, shank and tail piece, adopted at the recent meeting of the National Association of Brass Manufacturers, at



French Lick Springs, Ind. This blue print has just been issued by Wm. M. Webster, commissioner of the association, and it will no doubt prove of great interest to the plumbing trade. Mr. Webster calls special attention to the fact that the diameter of the hole in the tail piece coupling nut is nine-sixteenths of an inch. It is the intention of this association to adopt other standard measures from time to time. If manufacturers in Canada would do likewise they would earn the everlasting gratitude of every member in the sanitary engineering profession.

HOW TO MAKE CEMENT FOR RUST JOINTS

Take 5 lbs. cast iron borings (fine), 1 oz. powdered sal-ammoniac, 2 oz. flour of sulphur; mix with water. If not required for immediate use, a better cement is composed of 6 lbs. cast iron borings, 1 oz. powdered sal-ammoniac, and ½ oz. flour of sulphur, and mix with water.

Business for Heating Engineers

Heating Engineers Can be Patriotic, Make More Profits, Create New Business, Save Coal and Help Solve the Biggest Problem Next to the War, That of Transportation—Millions of Tons of Coal are Wasted in Canada Every Year

THE extreme cold weather of the past winter, combined with the high cost of coal, has made coal bills reach some very undesirable figures. The owners of heating systems who have had to pay these bills are doing some serious thinking right now trying to devise some scheme whereby a recurrence of this combination will not cause them such an expense. It is possible to have just as cold weather during the coming winter as we had during the past. It is not only possible but highly probable that the cost of fuel will be as high or higher than it was last winter. However, the efficiency of his heating system can be increased so that it will consume less coal and consequently decrease the size of that coal bill.

This means a job for the heating engineer. Patriotic motives as well as business should prompt that every heating engineer get busy and find out where those coal wasting systems are. There are a few in the territory of every contractor and he will be doing a good service to get in touch with some of them. Possibly the removal of a few air valves or some slight change in piping will transform a coal wasting system into a coal saving system. Possibly the chimney is not suitable for the job or the boiler may be dirty because of improper firing.

These are only a few suggestions but are ones of common source of trouble, familiar to every heating engineer. The owner in most cases will be susceptible to suggestion at this time and will be ready to pay for the service if he is convinced that he is going to save coal, and it is the duty of every heating engineer to do his bit apart from the money there is in every job towards saving coal.

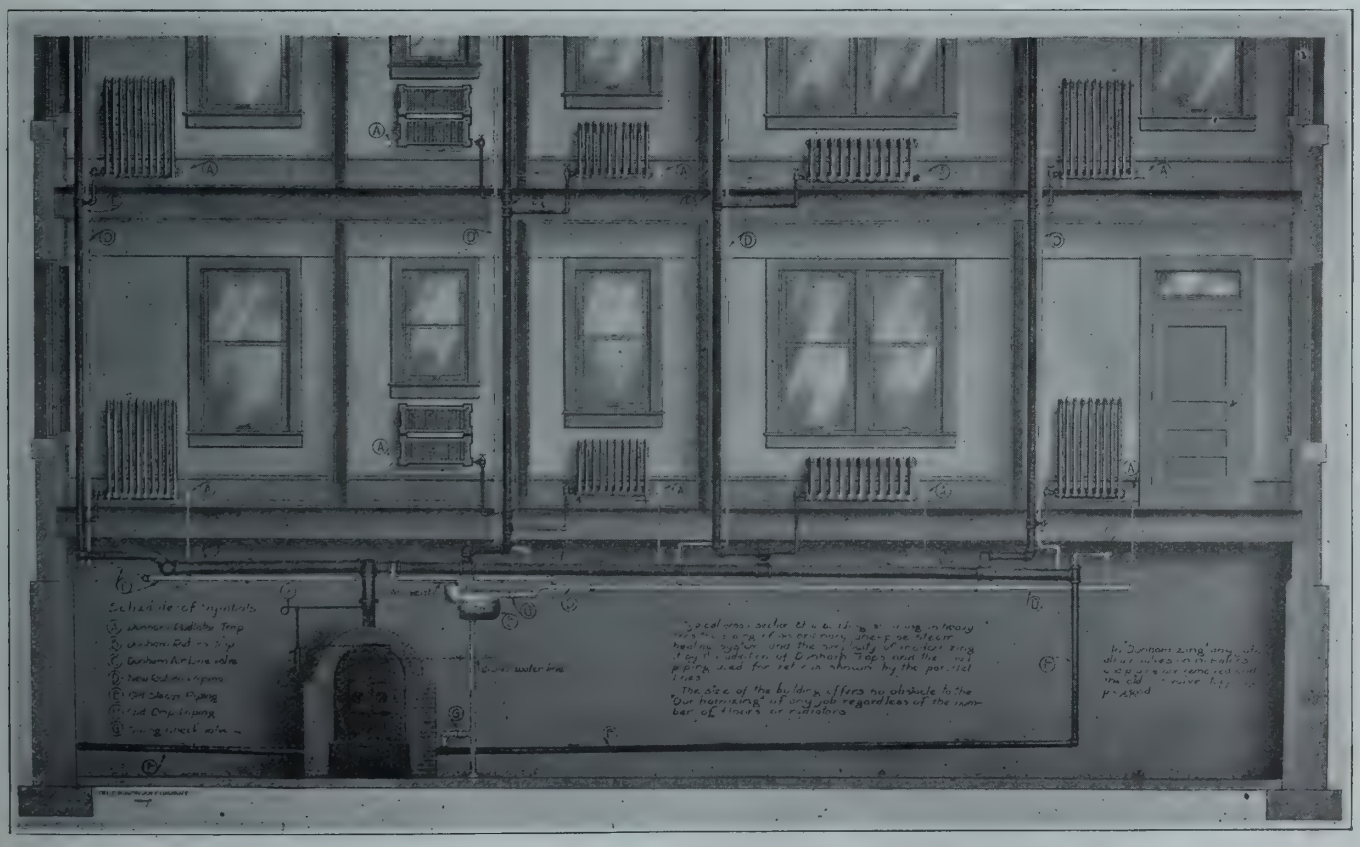
Of course we can quite realize that it is more or less a matter of salesmanship, but if our readers will take a few pointers embodied in this article and allow them to sink in good and deep, there will be no question about it, work will be procured, coal will be saved and splendid profits produced.

As we stated before, there are some cheap-jack one-pipe steam jobs in every district where sanitary and heating engineers are located, and speaking quite frankly possibly some of these jobs were installed by our readers in days when cheapness ruled from a first cost consideration on the one hand; or when the job was installed the reader was not so well versed in the science of heating as he is to-day. Be that as it may, there is no reason in the world why a heating engineer should not be able to go to the owner of one of those "one-pipe jobs" and show that owner what science has done and is doing to reduce the fuel bill.

The writer remembers quite well just such a case in the early days when one-pipe jobs were "the real thing," and when a man who could make steam pass in one direction while the water of condensation passed in an opposite direction, was looked upon as very much of a genius. To-day that same fellow is looked upon as a fool or worse. Of course the one-pipe jobs are still going in, and the coal pile is growing bigger in size and higher in price, and scores of boilers have been scrapped because of the fault pure and simple of the system of piping. In those "one-pipe steam job days," coal was cheaper, labor was cheaper, efficiency was unborn. Heating engineers were "steam fitters." What a title! But to-day there is no reason in the world why every man in the heating trade should not become more conversant with true efficiency, and scientifically installed heating systems.

For example the accompanying illustration which was furnished by the courtesy of the C. A. Dunham Co., Toronto, shows how a one-pipe steam heat-

(Continued on page 28.)



Cut and layout of a one pipe "change over" job, by Courtesy of C. A. Dunham Co., Toronto.

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HUMAN CARELESSNESS AIDS FIRE FIEND

THAT man is at least three times as destructive as nature, at least so far as forest fires are concerned, is revealed in a compilation which has just been issued by the Federal Forest Service. The figures of this agency show that of 7,814 forest fires on government lands during 1917, all but 2,132 were caused by human agencies.

Over 962,000 acres of timber in United States and forage and young growth to the value of $1,358,600 was destroyed. This loss, while larger than those of the past few years, is considered remarkably light in view of the unusually dangerous conditions which, owing to protracted drought and periods of high winds, were practically the same as in 1910, when many persons were burned to death and $25,000,000 worth of timber in the national forests was destroyed. It is estimated that in addition to the actual loss in timber, etc., $1,121,451 was spent by the Government for the purpose of fire fighting and prevention.

TRUE EFFICIENCY MUST CONTAIN THE ELEMENT OF HUMANITY

DURING recent years the word efficiency has attained a widespread notoriety, having been used and misused with a frequency only equalled by that later arrival, "camouflage."

The outstanding example of efficiency extraordinary is of course the German nation. It is also a convincing demonstration that there are limits to the development of efficiency beyond which it is not safe to go.

The efficiency curve of a nation as shown by the Hun tragedy is somewhat akin to the characteristic curve of a shunt-wound dynamo. Up to a certain point an increase in load is accompanied by an increase in output, but when the peak is passed the curve droops with increasing rapidity. A further increase in load means a disastrous drop in output accompanied by failure of the machine to generate.

Students of the situation, especially with reference to industrial conditions, will doubtless agree with a recent utterance by a certain Englishman who said: "We are now undergoing a phase of reaction against efficiency. A few years ago we were all for efficiency, and especially for German efficiency; but now, when we see the effect of efficiency on a great nation which had set itself to govern the whole world and had lost its own soul, there was reaction against an efficiency which might lead to such disastrous moral results."

Progress, however, viewed in the light that it places happiness and contentment above material accomplishment, is a higher ideal than straight mechanical efficiency which is an admirable feature of machinery but becomes repulsive when applied too strictly to human beings.

Modern science enables machines to be made which are exact duplicates of each other in ability as well as dimensions. Man, a creature of flesh and blood, has variations in these respects which form the real bond of union and human interest amongst the inhabitants of the world. The moment an attempt is made to level out the efforts and demands on men just so soon does progress come to a standstill.

As remarked by a contemporary, "We cannot avoid the conviction that the mechanics of the past, who were masters of craft, were more human than will be the mechanics of the future, brought up to perform for a few hours a day one simple operation, and one only. We doubt, indeed, if the fact that they will enjoy more leisure will ever quite counterbalance the dwarfing effect of performing for five or six hours a day an operation compared to which squeegeeing the mud off a pavement is a high art."

PRINCIPLES OF BANKRUPTCY ACT ENDORSED

ENDORSATION of the principles underlying the drafting of the Bankruptcy Act, which was introduced in the House of Commons at Ottawa by S. W. Jacobs, of Montreal, was made recently at a meeting of the special committee by a delegation representing the retailers of the Dominion. Members from each of the provincial associations were present, headed by H. Chevrier, president of the Dominion Association, Winnipeg,, and Henry Watters, chairman of the Eastern Ontario and Ottawa District Retail Merchants' Association.

While the merchants believed that legislation of the character proposed would be beneficial, they were of the opinion that the wholesale merchants would, under the bill as it now stands, receive greater consideration. They urged that retailers were not sufficiently protected and suggested amendments in this connection.

Claiming that all professional men, and even farmers, should come under the provisions of the act, they declared that "legislation of this nature should not be limited in scope, nor confined to any class, nor recognize any misdemeanor, but it should be wise enough to embrace all classes and conditions of men."

Market Conditions and Tendencies

Statements Regarding the Prices and Trend of Supplies.

THE MARKETS AT A GLANCE

REPORTS from the United States intimate that efforts to improve the situation as regards commercial supplies of steel are being exerted. The trade in Canada dependent on shipments from the United States will be glad to know that an analysis of war requirements in the light of the time it will require to consume each batch of steel is being made, and in this way arrive at an idea as to how much steel per month will be required for direct war activities. This will also result in a knowledge of probable supplies and determine Government action in regulating distribution of surplus, if any, to industries helpful in winning the war. Hopes are entertained that there will be enough steel for most commercial industries, and jobbers are looking forward to a somewhat better service in the way of deliveries in the near future. This should be reflected here in due time, and at the present there are very fair shipments of sheets being received which it is hoped will continue until a definite and satisfactory basis is reached.

Another big advance in porcelain and vitrous products has become effective, and manufacturers will only accept orders at prices ruling at date of shipment. In spite of high levels reached, reports locally indicate a larger percentage of this expensive material being sold than in previous years at this time.

Ingot metals show little change during the past couple of weeks. Tin is in scarce supply, and although declines at primary points have been registered, these are not reflected here. Lead is slightly firmer, while spelter holds unchanged. No revision from established price on copper is expected for the next three months' period. Business generally shows some improvement.

TORONTO, May 29.—There are no particularly outstanding features in any of the markets during the week as far as actual price changes are concerned, quotations throughout holding very firm. Porcelain and vitrous ware are again in the limelight with a further advance. Extra heavy and double extra heavy pipe are also higher, though standard remains unchanged. Business is reported as being very fair.

Firm Situation Shown in Range Boilers

RANGE BOILERS.—The scarcity of sheets expected to develop as a result of heavy Government requirements will, it is thought, be reflected in the output of range boilers, and may result in somewhat higher price levels being reached. Present stocks are none too heavy, and what the future may bring forth is a question.

	Standard	Extra Heavy
30-gallon range boilers	$14.00	$17.00
35-gallon	17.00	20.50
40-gallon	20.50	24.00
52-gallon	28.00	32.00
66-gallon	37.00	42.00
82-gallon	45.00	50.00
100-gallon	62.00	70.00

Enamelware Firm; Porcelain & Vitrous Ware

ENAMELWARE.—The position of enamelware remains firm and a slight improvement in demand is reported, with the movement expected to show a gradual increase during the next few months. Prices below show no change.

Porcelain and vitrous ware has made another big advance, prices now ranging at extremely high levels. Manufacturers indicate that orders will only be accepted at prices ruling at date of shipment.

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Sinks, roll rim, 18 x 30 in., staple	16 80
Closets, oak tank and seat	22 00
Do., enamel iron or white vitro tank	23 75

Very Firm Tone In Soil Pipe; Fittings

SOIL PIPE, FITTINGS.—Soil pipe and fittings remain very firm, though no changes in price have yet been made. Indications point towards higher price levels, but discounts hold at figures given below. Cast iron and malleable iron pipe fittings are holding steady at new discounts named in last issue and shown herewith. Business is reported as very good.

SOIL PIPE FITTINGS.

Medium and extra heavy soil pipe, 6-inch and under	35%	2½%
8-inch soil pipe	....	30%
Medium and extra heavy fittings, and under	40%	2½%

C. I. PIPE FITTINGS.

Cast iron fittings	....	10%
Cast elbows, tees, etc.	....	10%
Plugs	....	20%
Bushings	....	20%
Flange unions, standard	....	10%
Dart unions, ¼-inch to 2-inch	20%	25%
Do., 4½ in. and larger	....	15%
Nipples, up to 4-inch	....	45%
Do., 4½-inch and larger	....	40%
Do., running thread 4-in. and under	....	25%
Couplings, 4-in. and under	....	35%
Do., 4½ in. and larger	....	15%

MALLEABLE FITTINGS

Malleable Fittgs., Class A, lb.	0 55-0 56	0 66-0 70
Do., Class B., lb. net	0 24-0 25	0 34-0 35
Do., Class C., lb. net	0 16-0 17	0 24-0 25

Waste Moving; Oakum Light Demand

WASTE, OAKUM.—A good movement of waste continues to be manifest and manufacturers are being kept very busy. Oakum is in comparatively light demand when business of a month or so back is considered, but a nice volume of orders is being handled now. Prices are unchanged at figures shown below:

	Per 100 lbs.
Best American	$21 50
Clipper, spun	21 00
Do., unspun	19 50
Plumbers', spun	10 00

Very Good Demand Reported For Valves

VALVES.—A very good demand is reported for valves and orders are being taken care of fairly satisfactorily. Some difficulty in securing supplies of raw materials is being experienced. Prices are changed, as noted herewith:

	Discount off list
Ground work	50
Compression work, standard	52
High grade	45
Cushion work	46
Fuller work, standard	50
High grade	43
Basin cocks, No. 0 standard	46
Nos. 1 and 2	46
Bath cocks	53
Flatway stop and waste cocks, standard.	53
High grade	50
Roundway stop and waste cocks, standard	53
High grade	50
Brass steam cocks, standard	Net
Globe, angle and check valves, standard.	10
Do., removable seat	7½
Radiator valves, standard	15
Do., removable seat	10
Patent quick opening valves	35
Basin Cocks—	
No. 0 and 1, Fuller pattern	50

No. 0 and 1, compression	46
Midget	50
Globe, angle and check valves, medium pressure	30
Radiator valves, standard	30
Radiator valves, Jenkins disc	30
Radiator valves, quick opening	40

Wrought Iron Pipe Holds Very Firm

WROUGHT IRON PIPE.—No new developments have been reported in respect to wrought iron pipe. Shipments of raw materials are not coming through in any too liberal quantities and production consequently is limited. Only a fair volume of trade is being transacted. Prices remain unchanged at figures shown in panel herewith. An advance in extra heavy and double extra heavy pipe has been made, but this has not influenced standard as yet.

No New Developments In Boiler Tubes

BOILER TUBES.—There is nothing new to report in respect to boiler tubes, conditions prevailing during the past few weeks showing little change. Orders are being subjected to very careful scrutiny before shipment is made. Prices are unchanged.

Toronto—	Per 100 feet Cold drawn	Lapweld
1 inch	$36 00	$ ....
1¼ inch	40 00	....
1½ inch	43 00	36 00
1¾ inch	43 00	36 00
2 inch	50 00	36 00
2¼ inch	53 00	38 50
2½ inch	55 00	42 00
3 inch	64 00	50 00
3¼ inch	....	58 00
3½ inch	77 00	60 00
4 inch	90 00	75 00

Sheets Reveal Firming Tendency

SHEETS, PLATES.—A firming tendency in galvanized sheets is noticeable, though no change has been reported as yet. Uncertainty seems to be the predominating element in respect to further supplies of sheets. In some quarters advices are to hand that contracts placed prior to certain dates will be filled, while other reports indicate contracts will be acted upon only when Government needs have been taken care of. If the latter prove the rule, it will mean that little can be expected in the way of delivery for some months, owing to increasingly heavy demands being made for war work by the Government. That conditions in Canada may undergo regulation to some extent by officials at Ottawa seems within the realm of possibility though local dealers know little in this connection as yet. Prices are as follows:

BLACK SHEETS—			Per 100 lbs.
10 gauge	$....	$9 50	$12 00
12 gauge	7 15	9 60	10 00
14 gauge	7 20	8 15	8 40
16 gauge	7 25	8 25	8 50
18-20 gauge	7 30	7 80	8 05
22-24 gauge	7 35	7 85	8 10
26 gauge	7 40	7 90	8 15
28 gauge	7 50	8 00	8 25
3-16-inch plate	....	9 10	10 25
¼-inch boiler plate	....	9 00	10 00
GALVANIZED SHEETS—			
10¾ oz.	$9 00	$9 25	$9 50
U.S. 28	8 70	8 95	9 20
U.S. 26	8 40	8 65	8 90
22 and 24	8 25	8 50	8 75
18 and 20	8 10	8 35	8 60
16	7 95	8 20	8 45
14	7 85	8 10	8 35

WROUGHT IRON PIPE

Effective Feb. 26, 1918

Standard Buttweld—	Per 100 feet Black	Galvanized
⅛ in.	$ 6 00	$ 8 00
¼ in.	5 16	7 29
⅜ in.	5 16	7 29
½ in.	6 55	8 12
¾ in.	8 28	10 41
1 in.	12 24	15 39
1¼ in.	16 56	20 82
1½ in.	19 80	24 89
2 in.	26 64	33 49
2½ in.	42 71	53 53
3 in.	55 85	70 00
3½ in.	70 84	87 76
4 in.	83 93	104 10
Standard Lapweld—		
2 in.	29 60	36 08
2½ in.	44 46	54 70
3 in.	58 14	71 53
3½ in.	72 68	90 62
4 in.	86 11	107 37
4½ in.	97 79	122 56
5 in.	114 00	142 82
6 in.	147 80	185 28
7 in.	192 80	241 57
8 L in.	202 50	253 75
8 in.	233 30	292 32
9 in.	279 50	350 18
10 L in.	259 20	324 80
10 in.	333 70	418 18

Terms 2% 30 days, approved credit.
Prices—Ontario, Quebec and Maritime Provinces.

Manufactured Lead Products Firm; Solder

LEAD AND ZINC PRODUCTS.—Manufactured lead products show no change during the week. The primary on lead is holding firm but with the small demand for plumbing lines, little change in the situation as regards the manufactured products is expected. Solder, which has been enjoying a period of advancing prices, shows no further change and quotations given below are now ruling:

Lead pipe, lb.	$ 0 14	$ ....
Lead waste pipe, lb.	0 15	....
Lead traps and bends	Net list	
Lead wool, lb.	0 16	
Lead sheets, 3 to 3½ lbs. sq. ft., lb.	0 13¼	
Lead sheets, 4 to 8 lbs. sq. ft.	0 12½	
Cut sheets, ¾c lb. extra, and cut sheets to size, 1c lb. extra.		
Solder, guaranteed, lb.	0 66	0 70
Solder, strictly, lb.	0 60	0 66½
Solder, commercial, lb.	0 55	0 62
Solder, wiping, lb.	0 54½	0 56
Solder, wire, lb.	0 65	0 70

Very Quiet Tone In Old Materials

OLD MATERIALS.—Business in old materials is relatively quiet at present and dealers are apparently carrying little stock other than that required to supply the needs of regular customers. The feeling of uncertainty that has characterized this market for some weeks is still a feature of existing conditions. No price changes are recorded, but slight uneasiness is reported. Machine cast iron is strong and in good demand, but the nominal quotation of $31 is the price given by dealers here. Some dealers are looking forward to higher prices on scrap copper.

Tea lead	$ 0 04½	....
Heavy lead pipe	0 07	0 07½
Yellow brass	0 12	0 13
Red brass	....	0 21
Light brass	....	0 09½
Heavy zinc	0 05½	0 06
Heavy copper	0 21½	0 22
Stove plate, per ton	17 00	18 00
Old cast iron, per ton	25 00	26 00
Zinc sheets, per lb.	0 26	....

Tin Holds Unchanged; Lead and Spelter Firm

INGOT PRICES.—Prices on tin have held firm and unchanged since last issue. No relief from the acute shortage has been felt and supplies are gradually reaching the vanishing point. Lead shows a little strength but there is very little movement. Spelter held firm, but there are few transactions being effected. Copper remains unchanged with supplies ample.

COPPER.—Requirements for essential war purposes are being taken care of, but little interest is shown in domestic consumption which has reached a very low point. Indications are that present prices will hold in United States for a further three months period. Local quotations are around 29c to 30c pound.

TIN.—Tin has held steady on the local market at about $1.50 per pound, though declines in both London and United States markets have been reported. The acute and uncertain position of tin is still pronounced. Local dealers report the demand restricted to essential requirements, only those in urgent need getting any supplies.

SPELTER.—Little interest is manifest in this metal, and an unchanged position rules at primary points. Buying is normal, but that is within restricted channels. Prices hold at around 9c per pound.

LEAD.—A slightly firmer tone has been noticeable in lead locally, prices now being named at 9¼c to 9½c per pound, ½c up. Outside of war requirements there is practically no lead moving, domestic consumption being at very low levels.

ALUMINUM.—There is little demand and the market holds unchanged at prices ruling for some time past, viz., 50c per pound.

ANTIMONY.—Quiet prevails in this market and there are no outstanding features to report. Quotations at primary points hold firm and the same condition rules here, prices locally being about 16c per pound.

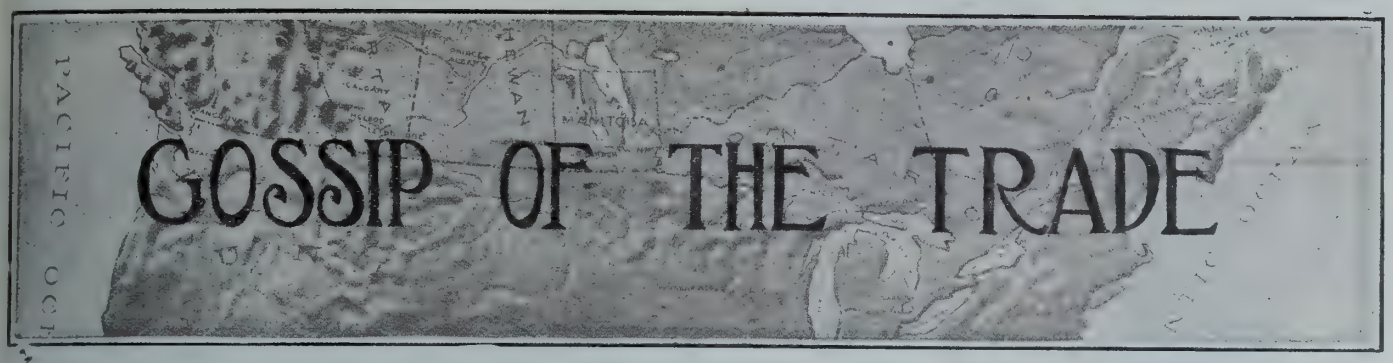
PIG IRON.—There is nothing new in pig iron and no predictions as to the future are offered. Output of iron is being absorbed as quickly as produced, but indications are that this is below requirements. Commercial demands are subservient to war needs.

CONSTRUCTION

Enniskillen Township, Ont.—The council contemplates extensive drainage work.

Hamilton, Ont.—A tile pipe sewer connection to the Wellington St. sewer will be made from the Canada Screw Company's plant.

Matheson, Ont.—Tenders will be called shortly for the construction of a waterworks installation, including intake, pump house and reservoir, also a sewerage system including a septic tank.



NEW APPOINTMENT

Mr. T. R. Waugh, who for the past ten years, has had charge of the Preston waterworks system, has resigned to take up a position in London. He has been appointed superintendent of the heating and plumbing systems of a large military hospital at a good salary.

PERSONAL

J. R. Dulaney, the manager of the Chamberlain Co., of Pittsburgh, and the Chamberlain Desolvo Co., Ltd., Toronto, is calling upon the Canadian trade.

He informs SANITARY ENGINEER that they have moved their Pittsburgh factory and warehouse to the Pittsburgh terminal warehouse of that city.

PUBLIC LAVATORIES REQUESTED

For some time there has been a movement on foot to establish public lavatories in St. Catharines. Many members of the Trade and Labor council are taking an active part in the scheme. At the regular meeting of the St. Catharines Trade and Labor council, held May 15, the question of public lavatories again came up for discussion, and after a lengthy debate the council decided to request the city council to establish an up-to-date public lavatory at the park, and to place a returned soldier in charge.

CONSERVATION AND RECLAMATION OF TIN

Much thought has been given to refuse collection recently, and the more one considers the matter the more apparent it seems that every town or city of any size should take note of such items as recently apeared in an Irish contemporary, the "Irish Ironmonger." Such an undertaking, however, should not be allowed to be tried out by the average unpractical garbage collection department heads, but rather by practical metallurgists, etc.

"A conference, representative of municipal and other local authorities in the Midlands, was held at Birmingham by arrangement with the National War Salvage Council, to consider the question of the utilization of waste.

"The Lord Mayor of Birmingham, who presided, stated that in Birmingham, 600 tons of old tins were collected annually by the refuse disposal department, and that the recovered tin was sold at £300 per ton. The sum of £7,000 was obtained from the sale of recovered waste paper. Food for poultry and pigs was made from material from the corporation slaughter-houses; condemned meat and fish were converted into valuable manures; fat was utilized for soap-making, and various classes of other refuse were made into kerbstones and the like.

"Mr. David Currie, Director-General of National Salvage, stated that salvage work, while of supreme national importance, was decidedly profitable."

A FEDERAL DEPARTMENT OF HEALTH

It is refreshing to see that the daily newspapers once in a while take thought and refer to the fact that a Federal Department of Health is a necessity, even though the reference be but very vague. According to the following item which appeared recently in the "Montreal Star" that worthy paper realizes that something should be done to stem the tide of deaths which occur from preventable diseases. SANITARY ENGINEER has for years advocated such a department with a number of other departments under its jurisdiction.

In a farm journal recently the writer of an article on sewage disposal systems stated that a cesspool with an overflow into a creek nearby was an ideal method of disposing of sewage. Such matters could and should be handled by the mechanical section of a Federal Department of Health. Until such a department is put into operation the death-rate will continue to increase as is the case to-day.

A Minister of Health

Montreal Star:—Over and over again it has been suggested that Canada should have a Minister of Health. If anyone doubts the wisdom of this suggestion, let him look at the facts regarding tuberculosis and insanity. Tens of thousands of tubercular subjects are dying every year while the absolute lack of isolation is insuring the contamination of other tens of thousands. On the Governments of Canada rests the blame for this negligence. There are a few sanitariums caring for a small portion of the consumptives of our country, and there it ends—a crying disgrace to our legislators who apparently never give to the one hundred thousand tuberculosis subjects a passing thought. Mental diseases also are little thought of and little cared for. Hundreds of insane men, women and children, many of them curable, are forced into lunatic asylums which in many cases are chambers of torture.

Every epidemic which takes place these days is a stigma upon the Federal Government. Provincial Governments are too lax, and many matters which are outside the powers of a provincial body should be dealt with by a Federal Board of Health.

CONSTRUCTION

Medicine Hat, Alta.—The Crystal Dairy Ltd., will erect a $25,000 creamery.

St. Rose du Lac, Man.—School will be erected for the school board at a cost of $30,000.

Aylesford, N.S.—Town council has prepared specifications for the erection of a town hall.

Fitzroy, Ont.—New tenders are being received on revised plans for brick school for the school board.

Byron, Ont.—Hospital building valued at $100,000 will be erected for the Invalided Soldiers' Commission.

Galt, Ont.—Tenders are being received for the erection of an addition to plant of the Galt Brass Co., Ltd.

London, Ont.—Tenders will be called for the erection of a $20,000 addition to hospital for the hospital trustees.

Capelton, Que.—H. G. James is preparing plans for $13,500 two-storey school for the Ascot School Commission.

Galt, Ont.—Tenders are being received for the erection of a three-storey brick addition to plant for R. McDougall Co.

Montreal, Que.—O. Archambault has the general contract for $200,000 school for the Roman Catholic School Commission.

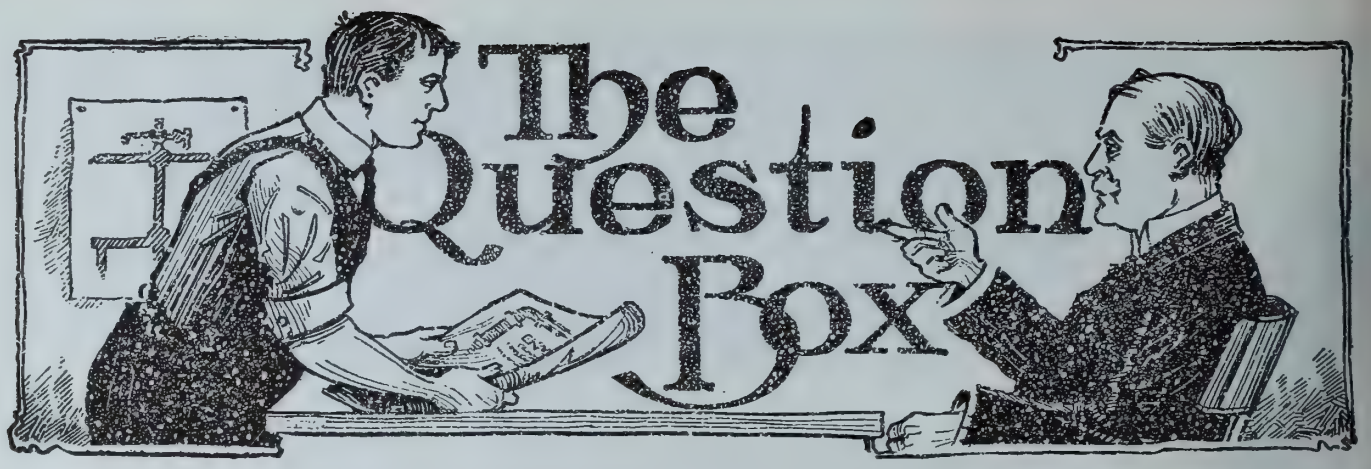
Brantford, Ont.—Plans have been prepared for a $35,000 Sunday school and parish hall to be erected for Grace Church.

Midland, Ont.—Additions and alterations will be made on residence and property presented to the town by James Playfair, for hospital purposes.

Owen Sound, Ont.—The Great Lakes Steel Corporation has purchased a match factory which will be remodeled for a steel products factory.

Winnipeg, Man.—Tenders are being received in connection with the erection of a $50,000 psychopathic building for the Winnipeg General Hospital.

(Continued on page 30.)



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

DEFINE SIMPLE MEANING OF THE TERM HORSE-POWER

Editor, SANITARY ENGINEER.—I am sure it would be very interesting to more than one reader of your valuable journal if you would define what is the real meaning of horse-power, and how the term horse-power was first arrived at; also what is meant by nominal horse-power and actual horse-power. Then there are two other terms I have often heard used, viz., brake horse-power and indicated horse-power.

HORSE-POWER.

It is said that Watt was responsible for the use of the term "horse-power," and in this way: Watt sold his engines to miners, who in his days used horses to pump water out of mines, as well as raise other material. Therefore, he referred to his engines as being so many horse-power.

It was estimated that a moderately strong horse can travel 2½ miles per hour and work eight hours a day, doing the equivalent of pulling 150 lbs. weight up out of a shaft by means of a rope. Two and a half miles an hour is equal to 220 feet per minute, and at that speed the load of 150 lbs. is raised vertically the same distance—that is equal to 300 lbs. raised 110 feet high, or 3,000 lbs. raised 11 feet high, or 33,000 lbs. raised one foot high per minute. The unit of power is the mechanical force necessary to lift 33,000 lbs. one foot high in one minute.

Actual Horse-power

Regarding the term actual horse-power, we must take for granted the above-mentioned basis. Therefore, to find the actual horse-power of a steam engine the following rule is adopted:

Rule—Multiply the area of the cylinder in square inches by the average effective mean pressure of the steam in pounds per square inch, minus 3 lbs. per square inch for friction, and by the speed of the piston in feet per minute. The product will be the number of foot-pounds per minute which the engine will raise.

Divide this product by 33,000 and the quotient will be the actual horse-power of the engine.

Brake Horse-power

The term brake horse-power is the power of an engine measured by a friction brake or dynamometer. It represents the effective horse-power or the indicated horse-power of an engine minus the power absorbed by its own friction. Brake horse-power and indicated horse-power have one and the same meaning.—Editor.

SIZES OF SUCTION AND DELIVERY PIPES

Editor, SANITARY ENGINEER.—Would you kindly inform me what is the proper size or relationship of size of suction pipe to delivery pipe? Is it usual to have the suction pipe larger than the delivery pipe?

PUMP TROUBLE.

The suction pipe of a pump should always be larger than the delivery pipe, because the friction has to be overcome in the suction pipe by the pressure of the atmosphere only; but in the delivery pipe the friction is overcome by the power of the pump. The suction and delivery pipes should never be less than one-half the diameter of the pump cylinder. A good proportion for the suction pipe is two-thirds of the diameter of the cylinder.

In quick action pumps it is sometimes necessary to make it as large almost as the cylinder. A long suction line should fall evenly along its whole length towards its source of water supply, as if any part of the pipe be higher than the pump end, or so as to leave a hump in the line, air will accumulate and be difficult to replace.

All suction lines should have a foot valve placed either at the end of the suction line or just above the high water level in the cistern or well.—Editor.

BUSINESS FOR HEATING ENGINEERS

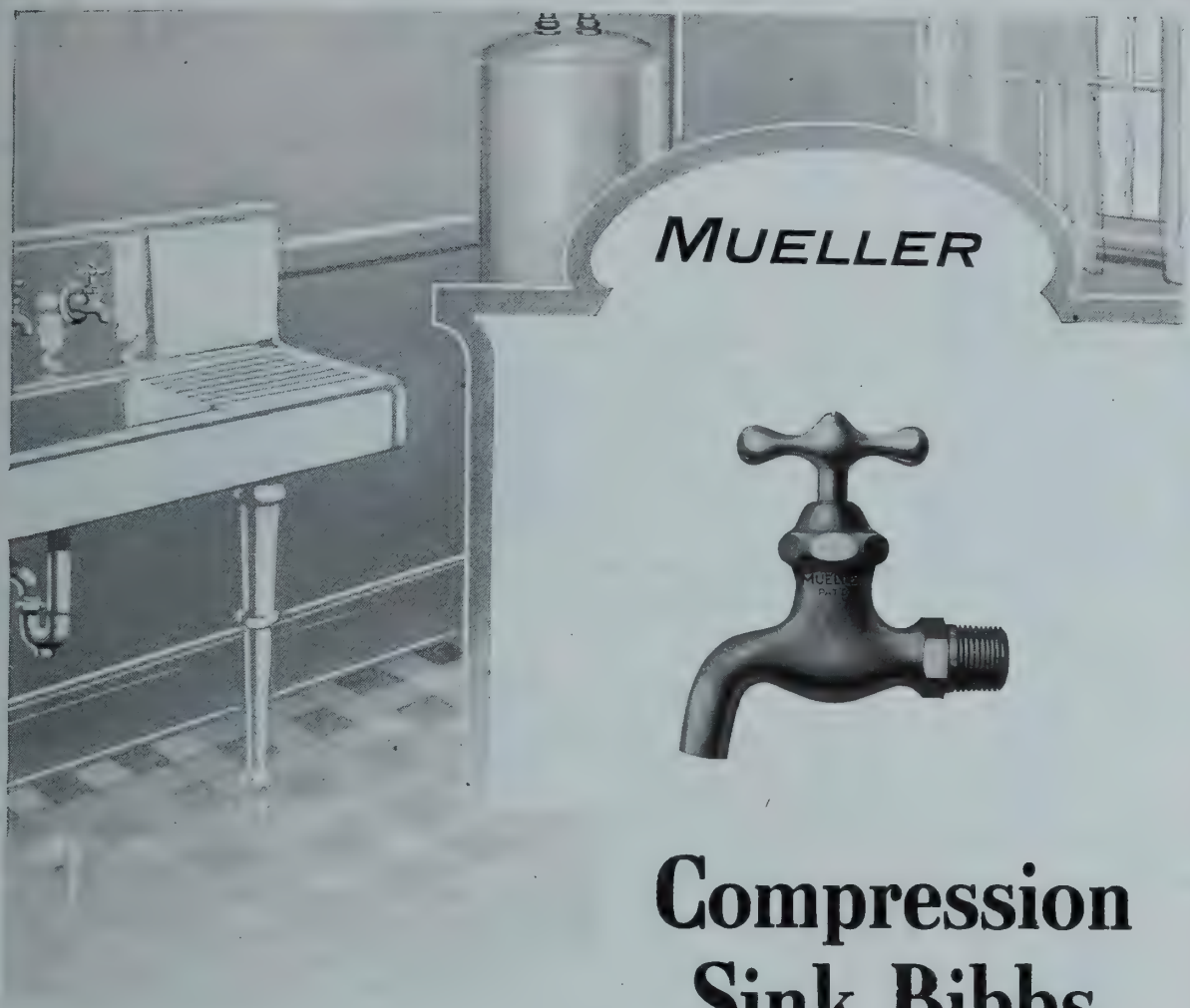
(Continued from page 23.)

ing system can be made a right up to the minute job, and this not only applies to the Dunham steam specialties, but to every other line of worth-while goods. Of course every manufacturer claims special features over his competitor, and this is as it should be, but nevertheless the real information described in the layout shown is of value to every heating engineer. It is of course taken for granted that there is sufficient radiation on the job and that the boiler is of ample size, this being generally characteristic of all one-pipe steam jobs. The layout illustrated shows the old boiler, radiation and piping (in black) as originally installed and which in most instances are of ample capacity, then by the use of an up-to-date radiator trap and the return piping, shown in lighter print, the system may be converted into a two-pipe system which will operate efficiently and quietly on a pressure of a few ounces, and continue to operate satisfactorily on a pressure up as high as ten pounds, and what is more, the job will be automatic and will save fuel.

Such a plan is practical and permits the change being made at a small cost, which will be a first-class investment to any owner.

And next comes the question of satisfied customers. There never was a time when saving fuel or lowering of the cost of upkeep would be more appreciated than to-day. It is not always a question even of cash saving, but is also a case of being able to get fuel at even any price. It would be next to impossible to expect that a whole winter's coal could be procured and stored by a person in every case because of the lack of room on the one hand and the laying out of the cost of fuel so long in advance. Then again if such a stock was ordered, the present calls upon the railway's rolling stock would not permit the coal being hauled so quickly. So that when a heating engineer approaches the owner of a building in which is installed a one-pipe steam heating system, he has all kinds of selling points to discuss, and he will not only be doing a patriotic duty, but will as stated before, be doing "his bit" towards the elimination of fuel waste, helping to solve the fuel transportation problem and at the same time making good profits into the bargain.

It's an opportune time for the heating contractor to make some enthusiastic customers whose good will means dollars in the years to come.



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Compression Sink Bibbs

Simple elegance, combined with superior strength and wearing quality, is what you give your customer when you install MUELLER goods.

The many advantageous features of MUELLER compression bibbs give maximum service from the bibb as a whole. The anti-spreading device that breaks up the whirling motion of the water and the corrugated stem and handle, allowing the handle to be set at any angle without becoming loose or wobbly, are only two of these features.

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SARNIA CANADA

MUELLER

When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER.

HOW TO SELL STATIONARY VACUUM CLEANERS

(Continued from page 19.)

piped for a stationary vacuum cleaner, and for a month or more he made no success in selling the house. Finally the owner agreed to put the machine in, and so doing finally sold the house.

Another case was where a doctor had a good house for sale. It was piped, too, but until a machine was installed no sale could be made. He finally decided to take the house off the market, instal a stationary vacuum cleaner, and used it over a year. The machine earned such a reputation that one year after the house was sold for $1,000 more. The doctor declared it was the stationary cleaner helped considerably to sell the house at the advanced figure.

It is no doubt a fact that if many well-to-do owners were thoroughly convinced of the good points about and the service to be procured from such a machine there would be more sold by members of the trade. It is new business; it is a specialty with a nice selling profit attached to it, and once installed is a real business puller.

CONTRACTS AWARDED

Montreal, Que.—Buchanan & Lloyd have plumbing and heating contracts in connection with alterations to branch bank for J. E. Wilder.

Montreal, Que.—John Colford, 508 Guy St., has plumbing and heating contract in connection with the erection of a $16,000 garage and stable for Lord Atholstan.

Montreal, Que.—Nap Turcot, 1,600 St. Lawrence Blvd., has plumbing and heating contracts in connection with the erection of a $35,000 club house for the High Wah Club Ltd.

GOSSIP OF THE TRADE

(Continued from page 27.)

Ottawa, Ont.—Chas. Ogilvy Co. contemplate the erection of a storage building.

Peterboro, Ont.—Bradburns, Ltd., will rebuild business block costing $75,000.

Prince Rupert, B.C.—Plans have been drawn for a $15,000 concrete bank for the Royal Bank of Canada.

Regina, Sask.—Contracts will be awarded shortly for the erection of a $75,000 theatre for George Broder.

Sarnia, Ont.—Tenders are being called for the erection of a $15,000 two-storey brick office building for the Sarnia Bridge Co.

St. Catharines, Ont.—Westaway Company, Hamilton, are receiving tenders for the erection of a $25,000 one-storey brick factory building.

Tilbury, Ont.—The Canadian Forgings and Socket Co. contemplate the erection of munitions plant, etc., costing $200,000.

Toronto, Ont.—Tenders are being received for the erection of a $2,000,000 mail order building for the T. Eaton Co.

Montreal, Que.—The Foundation Co. Ltd. have general contract for $25,000 two-storey brick factory for Darling Bros.

Moose Jaw, Sask.—Carter-Halls-Aldinger, Winnipeg, have general contract for $35,000 store and office building for the Merchants Bank of Canada.

Windsor, Ont.—Wells & Gray have general contract for $60,000 factory for McGregor, Banwell Co., Walkerville.

London, Ont.—John Hayman & Sons Co., Ltd., want prices on steam heating equipment, tile flooring, etc., in connection with the erection of a $35,000 apartment.

WATERWORKS, SEWAGE, ETC.

East Oxford Township, Ont.—Tenders are being received for 3,600 lineal feet of tile, also for 1,150 feet of 12-inch tile and 2,500 feet of 10-inch tile delivered on the ground at Currie's Station for the township council.

Aylmer, Ont.—Plans will be prepared for a reservoir for the town council.

Edmonton, Alta.—City Council contemplate the construction of a $43,000 sewer extension on One Hundred and Twentieth Avenue.

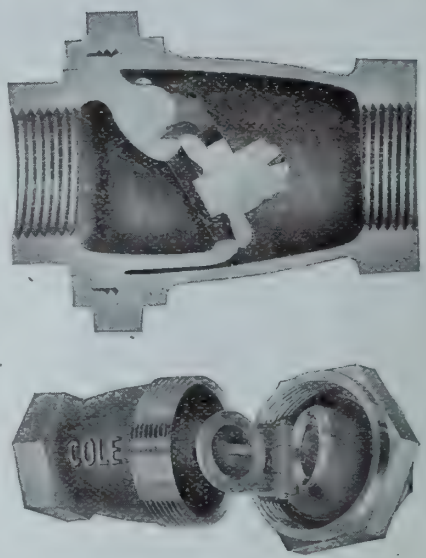
Hamilton, Ont.—The construction of a 20-inch water main, costing $6,000, by the city council, has been authorized.

Winnipeg, Man.—Contract was awarded to the Progress Construction Co., of Provencher Ave., St. Boniface, for a sewer at the Union Stockyards, $15,000.

Hawkesbury, Ont.—Town council will construct a filtration plant.

A CHECK VALVE THAT WILL CHECK EVERY TIME

We are proud of this new line and we know it will fill a long-felt want. Just take a look at these two views. It is made extra heavy to withstand hard usage, and is fully guaranteed.



Here is something really new in check valves. Can be placed in either horizontal or vertical position, and work right. It is a combination of union and check valve and is made right in every detail.

If you have ever had check valve troubles you will realize the reason why, as condensation engineers. We, like yourselves, had been "up against it." That's the reason why we invented and patented this new Cole Check. There is nothing just like it or anywhere near like it in its details.

Write us for full particulars and prices. They cost no more but are worth two of any other kind.

GEO. W. COLE LIMITED

Condensation Engineers

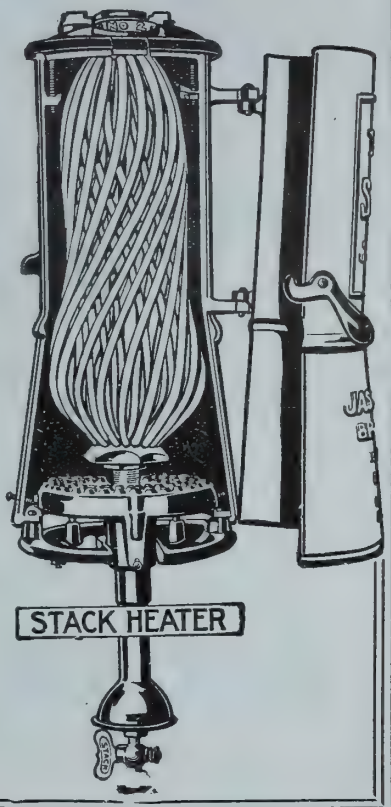
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The reason of Stack Superiority is easy to explain

All that is usually necessary in making a Stack Sale is the opening up of a Stack Heater to show the prospect.

The big feature of the Stack Gas Water Heater is the near perpendicular tubes in which the water is heated.

The water in Stack tubes is subjected to intense heat from the time it enters the heater until it is passed out of the coil. Small columns of water will heat much more quickly than a large coil, especially when heated from all sides. That's why it's so easy for the Stack to heat water in one minute. Just open the heater for your next prospect. It won't take so long to show him **why** he's getting the best heater on the market.



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FROM COAST TO COAST

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Hoyt Lead Traps, bends and waste pipe are in a class by themselves.

All our products are made to formula.

Our Mixed Metal Sales Amount To Over $5,000,000 Annually.



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Write Us

WE SPECIALIZE
In the Manufacture of
CAST IRON SOIL PIPE and FITTINGS
as well as
GALVANIZED RANGE BOILERS AND EXPANSION TANKS FOR HEATING SYSTEMS

TORONTO HARDWARE MFG. CO., LIMITED

EVERY "DAISY" YOU INSTALL WILL BRING YOU REPEAT ORDERS



The

"DAISY"

Hot Water Boiler

Over 50,000 in Use

SPEAKS FOR ITSELF!

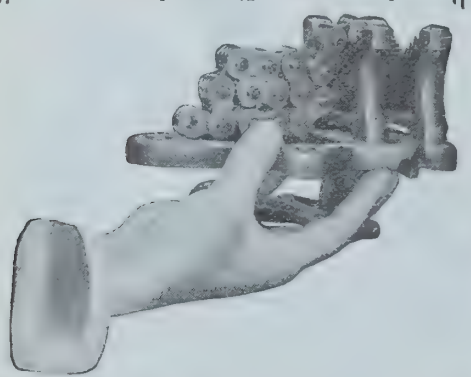
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SINCE IT'S ONLY A HANDFUL

WHY LEAVE IT BEHIND?

3 Sizes Capacities ⅛ to 8 inch Pipe



WILLIAMS "VULCAN" CHAIN PIPE VISE

Before you return you may need to turn a thread, make a bend, cut off an end or perform any of the other ordinary operations for which a steamfitter is usually summoned.

Better go prepared and clinch a life-long customer on your first visit.

They won the "Grand Prize" of the P.P.I.E.

J.H. WILLIAMS & CO.

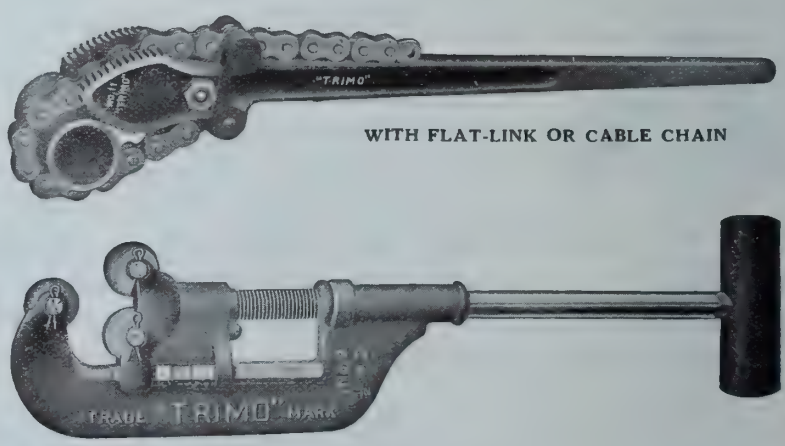
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World-Famed Specimens of the Age of Steel

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WITH FLAT-LINK OR CABLE CHAIN

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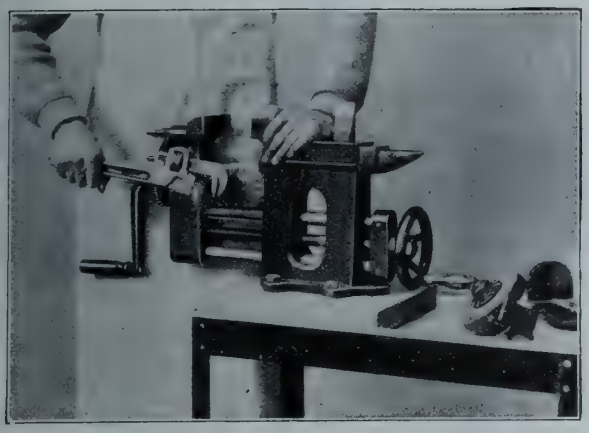
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An Equipment All in One



WEIGHS 90 POUNDS

The Equipment Comprises——

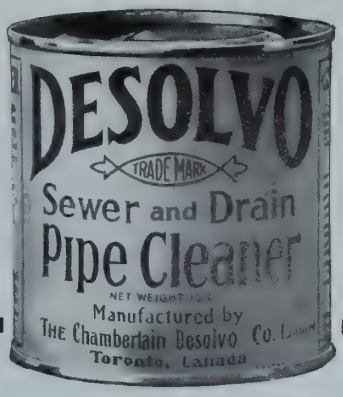
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A Bench Vise
A Bench Grinder
A Two-Speed Drill
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An Anvil

It's not a toy. It's a real combination of practical tools for practical people.

Write for full particulars.

CHICAGO FLEXIBLE SHAFT COMPANY
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Just *Cold* Water +



= a *hot* drain wash!

GET IT!

There is nothing like **Desolvo** for quickly and efficiently cleaning choked drains, waste and soil pipes, etc.

Users of **Desolvo** swear by it as an actual time and money-saver to them.

Just try it once—at our expense. Write for trial can on your letterhead.

Mention your Jobber's name.

THE CHAMBERLAIN DESOLVO CO.
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110 Church St., Toronto
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Pipe and the Public Welfare

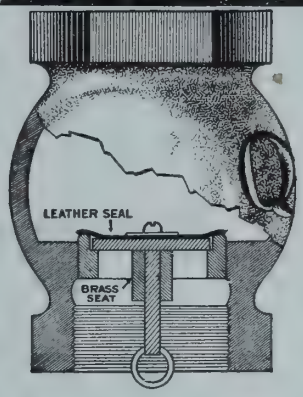
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A Book Just Off the Press

Every sanitary engineer should be the possessor of this book. It deals with pipe making of all kinds, cast iron, wrought iron, steel, wood and tile pipe. It is valuable because it gives the users of pipe a true idea of how pipe lasts under various conditions when in service.

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This is a "Q" Foot Valve

And it Just *CAN'T* Leak

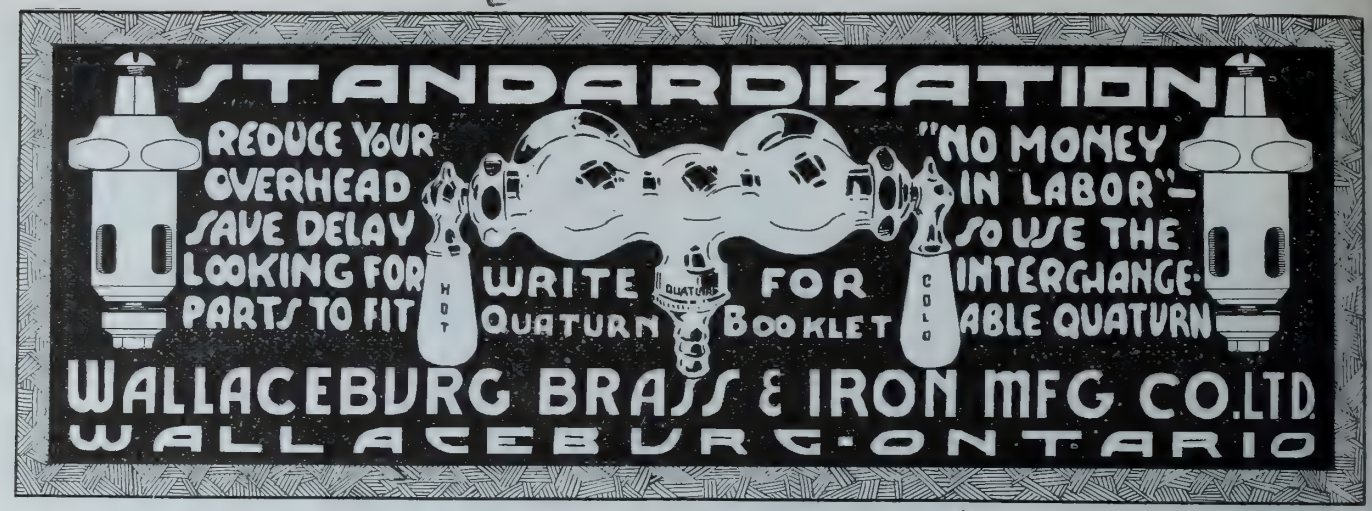
There are more pump troubles caused by "leaky" valves than from all the wear and tear which occurs in the average life of a pump.

The "Q" valve will overcome all priming troubles, and water once raised above it, through the suction line, will not leak out.

If you want the pumps you instal to give maximum, you will require to use the only valve on the market that JUST CAN'T LEAK.

Made in sizes from 1 to 8-inch.

R. MacDougall Co., Ltd.
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Standard Pattern Iron Body Globe Valve Screwed with Yoke.

This Valve Sells Best

Because—

Since 1864 Jenkins Bros. Valves have acquired a wide reputation for quality and trustworthy service in holding steam, oils, acids, water and other fluids in places where other valves do not "make good."

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King Boilers get up heat quickly

Very shortly after the fire is lighted in a King Boiler hot water reaches the radiators. The thin, peculiarly shaped waterways in the "King" mean quickly heated water and perfect circulation. The perfect circulation causes a saving in fuel because it obviates the necessity of "extra firing" to move cold water from the radiators.

The Trade should use this quick-heating, fuel-saving argument now while fuel is scarce and high in price.



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H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.

Pipe Cleanser
Chamberlain Desolvo Co., Ltd., Toronto.
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London and Toronto.

Pipe Cutters.
Borden Canadian Co., Ltd., Toronto.
Trimont Mfg. Co., Roxbury, Mass.

Pipe Joint Compounds.
Canadian Wolverine Co., Ltd., Chatham.
James Morrison Brass Mfg. Co., Ltd., Toronto.

Pipe, Soil, and Fittings.
Anthes Foundry Co., Toronto and Winnipeg.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Toronto Hardware Mfg. Co., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.
Warden King, Ltd., Montreal.

Pipe Threading Tools and Machinery.
Borden Canadian Co., Toronto.
John Hall & Sons, Ltd., Brantford.
A. B. Jardine & Co., Hespeler.

Pipe Wrenches.
Borden Canadian Co., Toronto.
Trimont Mfg. Co., Roxbury, Mass.

Porcelain Ware.
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
L. Wolff Manufacturing Co., Chicago.

Pumps.
C. A. Dunham Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Ltd., Galt.
Hurley Machine Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brassfounders & Engineers, Ltd. Cornbrook, Manchester, England.

Radiators.
Lord & Burnham Co., Ltd., Toronto.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.

Radiator Foot Rests.
Beaton & Cadwell Mfg. Co., New Britain, Conn.,

Radiator Traps (Steam).
C. A. Dunham Co., Ltd., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

Range Boilers
Toronto Hardware Mfg. Co., Toronto.

Reducing Pressure Valves.
C. A. Dunham Co., Ltd., Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

Roof Flanges and Flashings.
Canada Metal Co., Toronto.
Simplex Manufacturing Co., Chicago.

Rubber Goods
Canadian Consolidated Rubber Co., Ltd., Montreal.

Septic Tank Valves and Syphons.
Anthes Foundry Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

Solder.
Canada Metal Co., Ltd., Toronto.
Hoyt Metal Co., Toronto.

Steam Specialties.
Dart Union Co., Ltd., Toronto.
C. A. Dunham Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Kerr Engine Co., Walkerville, Ont.
James Morrison Brass Mfg. Co., Ltd., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

Steam Traps.
Geo. W. Cole Co., Ltd., Toronto.
C. A. Dunham Co., Ltd., Toronto.
Farnsworth Co., Conshohocken, Pa.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Smoke Test Machines.
James Morrison Brass Mfg. Co., Ltd., Toronto.

Testing Plugs.
James Morrison Brass Mfg. Co., Ltd., Toronto.

Tools.
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Trimont Mfg. Co., Roxbury, Mass.
Williams, J. H., & Co., Brooklyn, N.Y.

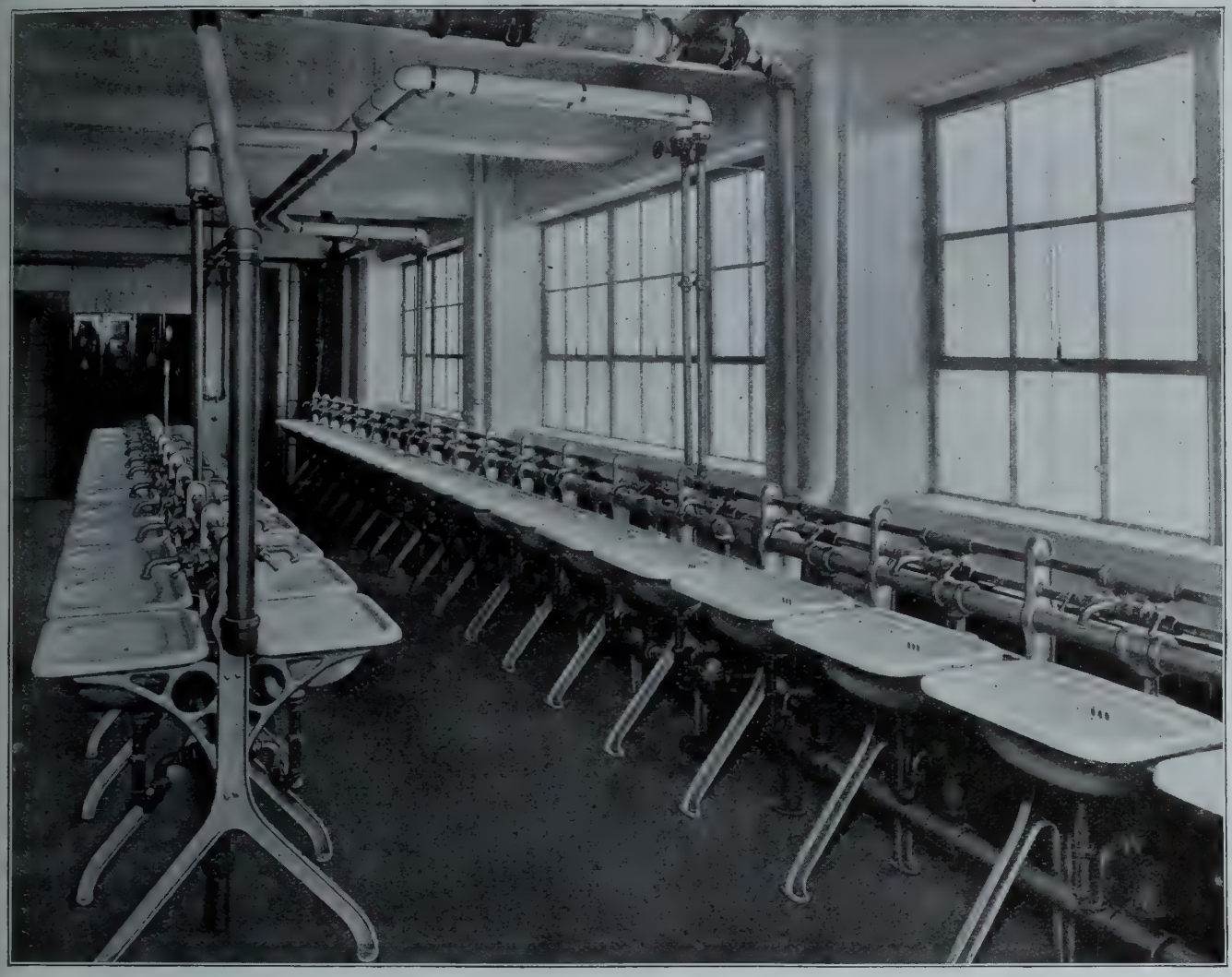
Unions.
Canada Metal Co., Ltd., Toronto.
Dart Union Co., Ltd., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

Vapor Heating Systems.
C. A. Dunham Co., Ltd., Toronto.
Moline Heat, Moline, Ill.

Vitro Tanks.
Galt Brass Co., Galt.

Vacuum Systems of Heating.
C. A. Dunham Co., Ltd., Toronto.

Water Supply Systems.
Empire Mfg. Co., Ltd., London and Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.



Wolff Installation, Goodman Plant, Chicago, Ill.

INCREASED EFFICIENCY in factories, business houses and schools follows the installation of high-grade plumbing, which insures the best sanitation and improved working conditions.

Wolff Plumbing

is the plumbing that makes for efficiency. It has been the standard of quality for over 60 years. It measures up to every requirement of the modern building. Write for catalogue.

L. Wolff Manufacturing Company

Manufacturers of Plumbing Goods Exclusively

General Offices: 601 W. Lake Street CHICAGO Showrooms: 111 N. Dearborn Street

John Wanamaker's Dominance

JOHN WANAMAKER surpassed the merchants of the days of his beginning because he had an idea that they didn't have: namely, to multiply sales and customers. John Wanamaker has possessed this identical idea ever since, and it has made him the prince of merchants.

Smaller men among manufacturers and retailers lack this idea: they devote more thought and effort to buying right and running their business trimly. But they are not master merchants.

Now great success cannot come to any firm or any man apart from the Wanamaker idea—which is to multiply sales and customers. Given this idea, and pursue it ardently always, and fortunes and dominance are secured.

The winning and holding of customers and the enlargement of sales call for the employment of advertising. The printed solicitation gets to buyers that flesh-and-blood salesmen cannot get to, and gets to them at right times, and wears down resistance. Printed solicitations produce friendliness, and accelerate the traveller's sales efforts when he calls. Printed solicitations lower the cost of selling. The flesh-and-blood man cannot call on men for much less than $2 a call. The printed solicitation can make calls for as low as a cent a call.

A cent a call! For this very small sum a seller can have access to a very complete list of buyers—the best of them as well as the most of them. A seller can get to this fine company of buyers no matter where they may be—in large cities, in crossroad villages, in off-the-main-line towns. He can get to foreign prospects—in Newfoundland, British West Indies, in South America. A seller can have access to a class of men who have formed the habit of reading advertisements as a necessary part of their day's work; and reading in particular the advertisements which are carried in their specialized business newspaper which they subscribe to, paying cash in advance therefor, and which they rely on for complete news relating to their business, including the news of advertisers—their proposals or statements about their goods.

All this for a cent a call!

Are you a director or official, with a voice in the selling policies of your house? And are you discouraging the use of advertising when advertising proposals come up for consideration? Think of John Wanamaker, Timothy Eaton, Marshall Field, Gordon Selfridge, Sears-Roebuck, Butler Bros., and a score of other firms making a great success. Think of the firms in Canada who have built up tremendous demand for their trade-marked, standardized and advertised product. And analyze the reasons for their great success. You will perhaps then have a new view concerning the function and value of advertising as a sales force or agent.

Then consider the cheapness of advertising to the retailer. You will get help from the table following:

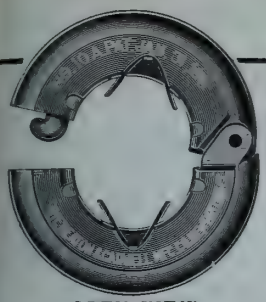
	Cost per page (minimum)	Cost per year for page space	Cost per call
Dry Goods Review	$35	$420	1 2-5 cents
Men's Wear Review	30	360	2 cents
Canadian Grocer	24	1,248	5-11 cents
Hardware and Metal	24	1,248	8-11 cents
Bookseller and Stationer	25	300	1 2-3 cents
Sanitary Engineer	16.70	400	1 3-4 cents

PRINTED solicitation at such low cost ought assuredly to be incorporated into the selling plans of every wholesale or manufacturing firm relying on retailers to distribute their products or merchandise. Will you discuss the matter with us?

The MacLean Publishing Co., Limited

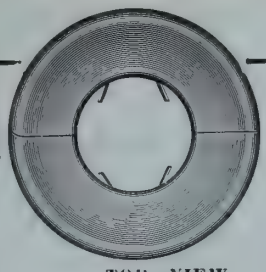
Toronto, Canada

Also at Montreal, Winnipeg, New York, Chicago, Boston and London, Eng.



OPEN VIEW NO. 10-A.

The CEILING PLATE that's better



TOP VIEW NO. 10-A.

THE NO. 10—A NARROW FLANGE PLATE IS A STEEL HINGED PLATE. FLANGES ¾" WIDE. HIGHLY FINISHED. ESPECIALLY DESIGNED FOR TWIN CONNECTION "NARROW."

The split ceiling plate is coming more and more into use than ever and ALWAYS GIVES A NICE FINISH, because it can be attached to mains and risers at the very last, and is not exposed during completion of a building on the floors.

High quality at the right price.



Gem No. 4.

Gem No. 4 Automatic Air Valve

Made from the best brass obtainable. Pressed shell and pressed brass base which eliminate danger from blowholes, which is a fault with cast bases.

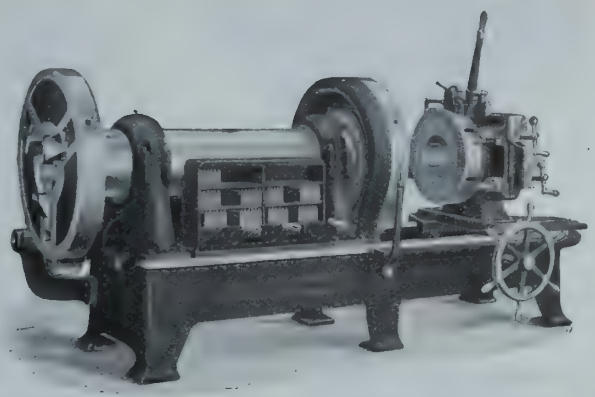
Write for catalog showing our complete line of specialties.

The BEATON & CADWELL MANUFACTURING Co.

New Britain, Conn.

Eastern Agent: J. R. Devereux & Co., 358 Beaver Hall Square, Montreal. Western Agent: A. E. Hinds & Co., Chamber of Commerce, Winnipeg.

Pipe Machines of Merit



THE HALL No. 8

Duplex Improved Gear Box Driven. Capacity 2½ in. to 8 in. inclusive.

Note the drive belt at rear out of operator's way. Elevated die cabinet, control lever and speed levers all convenient to operator's right hand. Sliding die head.

These machines are equipped with a friction clutch, enabling operator to revolve pipe a few inches, if necessary.

Pipe Machines ranging from ⅛ to 18".
Nipple Machines ranging from ⅛ to 4".
Roller Pipe Cutters ranging from ⅛ to 4".
Delivery from stock.

Write us for full particulars and prices.

John H. Hall & Sons, Ltd., Brantford, Can.

WROUGHT PIPE

BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES

Black and Galvanized All Sizes

Ask your jobber for CT Brand

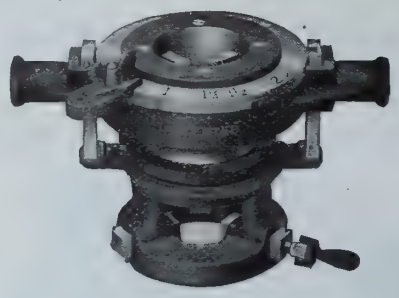
CANADIAN TUBE & IRON CO., LIMITED

Montreal Works: Lachine, Can.

After the War——What?

The time to put on fire insurance is before the fire. The time to prepare for after-the-war conditions is before peace comes.

Advertise now and be prepared to keep your goods in demand through the medium of SANITARY ENGINEER.



PIPE THREADING AND CUTTING TOOLS

One Man Can Thread up to 12 Inch.

You cannot afford to expect your men to make horses of themselves. If they did they could not keep it up. Our tools save time, do better work and makes life worth living for your men.



Cuts Without Burring

No. 1 cuts from ⅛″ to 1″
No. 5 cuts from ½″ to 2″
No. 10 cuts from 2½″ to 4″
No. 15 cuts from 4″ to 6″

Ratchet	Geared
No. 6—¼″ to ¾″.	No. 41—2½″ to 4″.
No. 25—1″ to 2″.	No. 61—2½″ to 6″.
No. 26—1″ to 2″.	No. 80—4½″ to 8″.
	No. 90—9″ to 12″.

The Borden-Canadian Company
TORONTO, CANADA

"JUST ONE MINUTE"

To call your attention to the Famous B & C Floor and Ceiling Plates.
Our No. 15 style narrow flange designed for the Canadian trade.

One of many styles



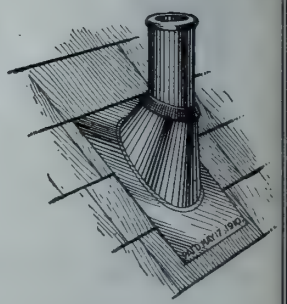
No. 15

Handsomely nickel-plated or plain
Sizes ½ to 2″

Stock now carried by our Canadian Representative
W. H. CUNNINGHAM, 183 CHURCH ST., TORONTO, Canada
THE BEATON & CORBIN MFG. COMPANY
Southington, Conn., U.S.A.

The **SIMPLEX**
Adjustable
Roof Flange

Fits any roof from ½ pitch to flat—just slide it down the pipe and it will conform with the pitch of the roof.



Trade Price 2″ $1.00 4″ $1.15

Made in all sizes—For sale by nearly every jobber
Simplex Mfg. Company - Chicago, Ill.
Canadian Representative W. H. CUNNINGHAM, 183 Church St. TORONTO, ONT.



Rogers Malacca Cleaning Rods

for cleaning boiler tubes, chimney flues, soot chambers and underground fitings—saves excavating. Fitted with Scraper, Brush, Screw and Plunger.

DARLING BROTHERS LIMITED
120 PRINCE STREET - - MONTREAL

IT IS IMPORTANT!

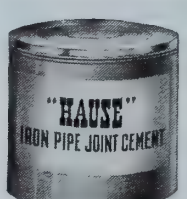
If you have something to dispose of in goods or service that as many buyers as possible get to know you and your product. This can be accomplished through

Sanitary Engineer
143 University Avenue, Toronto

"HAUSE" PIPE JOINT CEMENT

For steam, water, air, oil, gas, gaskets, etc. The cement that cements. Sets like gum. Allows no leaks.

The Great Value of "HAUSE PIPE JOINT CEMENT" lies in its peculiar chemical properties which permits of its hardening and expanding after the joints are made up. In making up joints it has the same effect as a lubricant on the best graphite, and while the joints may be made and broken readily, a perfectly tight joint is maintained at all times. Comes in 1-lb., 5-lb., 15-lb., 25-lb., 50-lb. cans, 100-lb. barrels. Manufactured in ready mixed and powder form. Ask your jobber for prices, or write us direct.



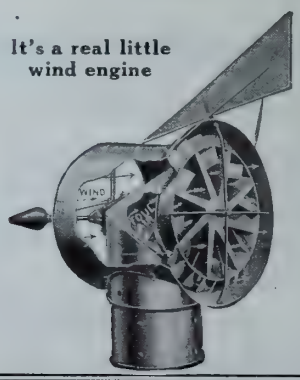
Manufactured in Ready Mixed and Powder Form.

Made in Omaha, Neb., U.S.A., by

Chas. F. Hause Mfg. Co., Inc., Omaha, Neb.

THE BICALKY

It's a real little wind engine



VENTILATOR
Is a positive suction fan that ventilates

The "Bicalky" will dispense with all auxiliary heaters on local ventilation systems.

It is, as far as we know, the most scientifically constructed, self-propelled fan ventilator on the market.

Write us for full particulars.

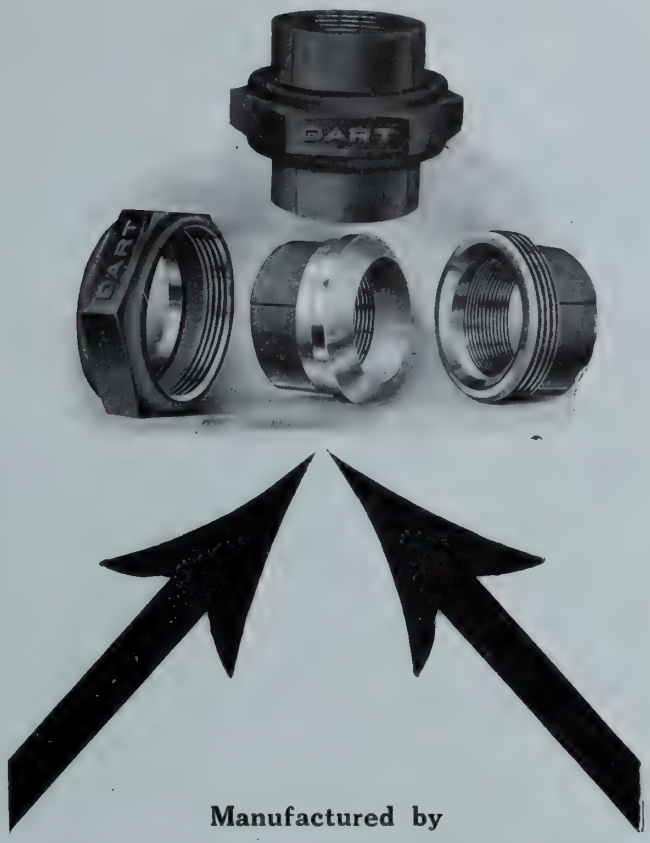
BICALKY FAN CO.
BUFFALO, N.Y.
Canadian Sales Agents:
J. S. Chapman & Company
89 Jarvis St., Toronto

SAVES TIME

Because—

There is a saving of **time** as well as an assurance of permanence in using Dart Unions. Pipe lines can be easily and quickly connected, whether in or out of alignment. Ball-shaped joints permit connection so long as the nut can be started on its thread.

Save time and have a better job by always using Dart Unions.



Manufactured by

Dart Union Co., Limited
TORONTO

SAVES MONEY

Because—

Extra service rendered and time saved is money **earned.** The bronze joints fit and wear so well that the Dart proves a "double value" union.

Satisfy yourself on this point. Next time just specify Dart Unions. They'll save you money.

All jobbers sell them.

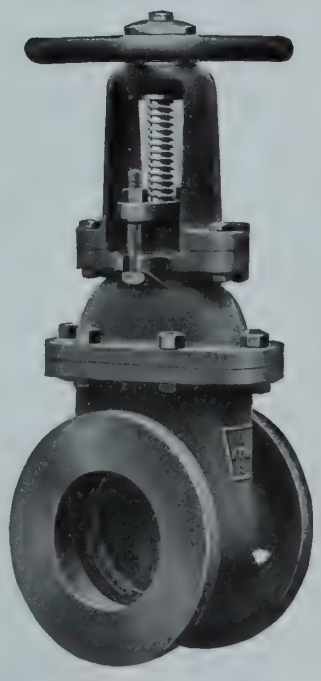
There Are Lots of Gate Valves

Advertised and Sold



but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.
Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.
Approved by the Fire Underwriters' Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario

EVERY FITTING TESTED

All in one Piece and —*Never needs repairing*

EVERY TANK GUARANTEED

The use of "Vitro" NO TROUBLE tanks materially help to maintain your reputation of giving best service and satisfaction to your customers.

Made without lining, they are guaranteed to stay tight because they are all in one piece and NEVER HAVE TO BE REPAIRED.

GOLDEN OAK

Read This Gilt-Edge Guarantee

A new tank will be given to replace one that any time proves defective from either material or defective workmanship.



Write for a Vitro Catalog.

GALT BRASS COMPANY
Limited
GALT ONTARIO

SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

Vol. XII. Publication Office, Toronto, June 15, 1918 No. 12

THE NEW "EMCO" GLOBE VALVE

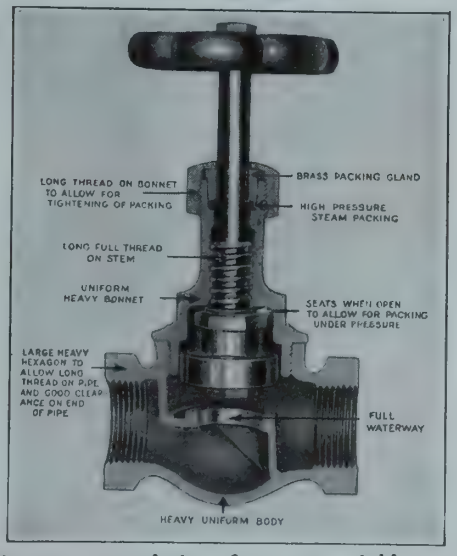
AND THE PLACE WHERE IT'S MADE



Just take a look at our **NEW EMCO** Globe Valve and note carefully a few of its good features. The long, full threads on spindle, the uniform thickness of metal.

It can be packed when open, is fitted with metal packing gland and is complete in every detail.

Every valve is packed with high grade packing before it leaves the factory.



This is only one of the many new lines we have made recently to fill some long-felt wants for high-grade valves.

We have one of the most modernly equipped brass manufacturing plants under the British flag.

We can make prompt shipments from stock. Let us quote you our prices on your next brass goods requirements.

When writing us or ordering from your jobber, ask for the EMCO GLOBE VALVE. It's a winner and we're proud of it.

EMPIRE MANUFACTURING COMPANY, LIMITED

LONDON TORONTO

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While



A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for BEAVER BRAND CAST IRON ENAMEL WARE

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

ONTARIO:
Monarch Brass Mfg. Co., 71 Brown St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes, 120 Lombard St., Winnipeg

CANADIAN CONSOLIDATED RUBBER CO. LIMITED
DOMINION
RUBBER SYSTEM
AND ASSOCIATED COMPANIES

ENGINEERING NEEDS

When the demand for some rubber need becomes urgent, it is some satisfaction to know that a prompt service is assured when your "hurry-up" order is placed with the Dominion Rubber System. Our nearest branch will take care of such orders in a way that will be eminently pleasing to you and to those you try to serve.

But when service goes hand in hand with quality and value, there is every reason for buying the Dominion Rubber System products. In that respect, whatever the need in rubber may be, we serve your interests to the best advantage.

It will pay you well to keep in touch with our nearest branch. Even the smallest order receives our careful consideration and attention.

Canadian Consolidated Rubber Co. Limited

HEAD OFFICE - MONTREAL

Branches at Halifax, St. John, Quebec, Ottawa, Toronto, Hamilton, Kitchener, London, North Bay, Fort William, Winnipeg, Brandon, Regina, Saskatoon, Calgary, Lethbridge, Edmonton, Vancouver and Victoria

Plumbers'

Brass Nuts and Screws Carefully Assorted

With Tweezers for Easy Handling

All sizes included that you will have use for in repairing Fuller and Compression Work.



Many other assortments of screws only, nuts only and Fuller and Compression Repairs Listed in Catalog "C".

Furnished in Strong Partitioned Metal Boxes

Canadian Wolverine Company, Ltd., CHATHAM, ONTARIO

PIPE THREADING TOOLS

It is Evidence Like This



"Toledo" Geared Adjustable Threading Tool No. 2 making a cut and thread on a 4-inch bend in position. It was desired to install a steam separator above throttle of engine, and the whole job was satisfactorily completed without removing the pipe line.

which proves the extra value of "Jardine" and "Toledo" Pipe Threading Tools

"Jardine" and "Toledo" Pipe-Threading Tools cut clean, sharp threads with a minimum of muscular effort. They permit of one man doing work which ordinarily requires two. But even more important than this, they will work in any odd corner. Instance the job illustrated in the accompanying engraving. Here is a case where, with an ordinary tool, the whole pipe line would have had to be taken down. The tool paid for itself on that one job.

Investigate "Jardine" and "Toledo" Tools yourself. Ask us to send names of users in your locality. Then go and talk to these men in your own business and learn what they think of these good tools.

A. B. JARDINE & CO., Limited, Hespeler, Ont.

Sole makers of "Jardine" Pipe-Threading Tools.
Sole licensees to manufacture and sell Toledo Pipe-Threading Tools in Canada.
Agents, Winnipeg and West—Stanley Brock, Ltd., Winnipeg, Man.
Brockville and East—J. R. Devereux, 358 Beaver Hall Square, Montreal.
Belleville and West—W. H. Cunningham, 183 Church St., Toronto, Ont.



We Have Big Stocks Ready for Shipment

So do not let your men wait for either soil pipe or fittings. The price of an extra fitting is soon lost in men's time.

If you are doing any country business, you will need a syphon for that sewage disposal system. It's against the law to run raw sewage into either lake, river or navigable waterways, and cesspools are both insanitary and dangerous.

ANTHES FOUNDRY LIMITED

TORONTO and WINNIPEG

Pipe Fittings

Made in Canada



The Brand that has the Quality

M Brand Pipe Fittings, etc., give a service and satisfaction that will invariably get you re-orders and much new business as well.

A trial of the goods will prove this claim.

CAST IRON FITTINGS

With this brand mean fittings made with iron of high tensile strength—proper proportions and correct tappings.

RECESSED DRAINAGE FITTINGS

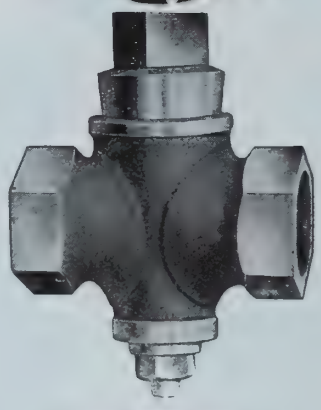
MALLEABLE FITTINGS

With this brand mean fittings made of Air Furnace Refined Iron, reamed and tapped to gauge with perfect threads.

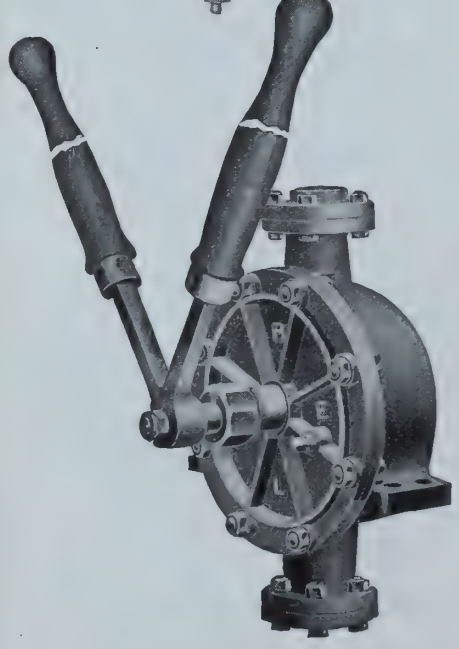
Standard and Extra Heavy Flanged Fittings and Flanges. Galvanizing Malleable and Gray Iron Castings of all Kinds.

International Malleable Iron Co., Limited, Guelph, Ontario, Canada









FIVE WORKS—OVER 3,000 EMPLOYEES

UNITED BRASS FOUNDERS and ENGINEERS, Limited

EMPRESS FOUNDRY

Cornbrook, Manchester, England

It is our intention after the War to devote our energies to the intensive production of the following Specialities:

- Gunmetal and Brass Valves and Cocks.
- Steam, Water and Compressed Air Fittings generally.
- Cast Iron Stop and Sluice Valves.
- Semi-Rotary Pumps.
- Extruded Brass and Bronze Bars.
- Brass Bolts and Nuts, Studs and General Turned Work from the Bar
- Cast and Malleable Iron Cocks and Pipe Fittings.
- Pressure and Vacuum Gauges.
- Injectors, Engine Governors.
- Spraying Machinery.
- Coppersmiths' Work.
- "Stella" Brand Alloys, Manganese Copper, Silicon Copper, Ferro Zinc, Phosphor Copper and Tin, etc.

Business After the War

If you are interested in any or all of the lines mentioned and are in a position to take a hand in the energetic distribution of the same, please communicate with us NOW to our Head Office at the above address.

"Standard"
"Perfection" Built-In Baths

Made in One Piece Enamelled All Over



These Baths represent the last word in design and finish, and are made to build into Right or Left Hand Corner or into a Recess.

The "Perfection" Built-in Bath is only 17½ inches high, therefore convenient. It builds into walls and floors, the absence of all dust-collecting cracks and corners, meaning bathroom sanitation.

Made in 5 and 5½ foot sizes.

Illustrations on request.

Write the nearest dealer.

Standard Sanitary Mfg. Co.
Limited

General Office and Factory, Royce and Lansdowne Aves., Toronto, Ontario

Toronto Store:
55-59 Richmond Street East

Winnipeg Showrooms:
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In the march of events there are times when manufacturers must measure up to unusual demands—or fall behind.

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Solder
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Write for Catalogue "A." Mailed Free.

The Canada Metal Company, Limited

Montreal Hamilton TORONTO Winnipeg Vancouver



Some Boiler Talk Overheard by an Ex-Spy on the Broadway Limited

WHEN you were a kid, did you have an Aunt Mary who, every time you said much of anything like any live boy ought to say, would always look over her glasses at you and say: "Little boys should be seen and not heard?"

Well, then, you and I belong to the very same lodge.

Last November, coming back from Chicago on the Broadway Limited, however, I heard but wasn't seen. What I heard, couldn't help hearing. Couldn't help, because I sat right behind the seat of the talkers.

First crack out of the box was a statement that before the winter was over the question of coal economies in boilers would have such a test as they had never had before.

It was evident that one of the talkers had some inside information about the coal shortage that afterward played the very hob with things.

Further than that, he declared that the enforced use of low grade fuel would bring to people's attention the advantage of the magazine feed boiler.

Then promptly came back the reply that magazine feeders were all right when you were sure you could always get the right kind of low grade fuel that was the right size. But if you couldn't, you were just as badly off as with any boiler.

What is needed, was his notion, is a magazine feed constructed some way so that it can burn anything from buckwheat to stove.

"Can't be done," said the other.

"It has been done," came back the reply. "Not only has, but is."

"By whom?"

"The Newport folks."

"Who in —— are they?"

Then followed an explanation about how a wide-awake, practical sort of fellow in the heating business schemed up a magazine boiler that had a movable throat, something like the bottom of a dumping wagon. You could close the opening for small coal or open it to suit large—and all the sizes betwixt.

Differing from all other magazine feeders, the throat was a water-filled surface that grabbed the heat just like any other well-behaved fire surface should.

Then they started talking about the grates and how on all down-hill or slanting types of grates, used on magazine feeders, the foot of the hill needed shaking the most, because there was where the ashes collected most.

Promptly came the come-back that this boiler had a combination two-speed grate operated by the one handle. A high speed at the bottom; low speed for the rest.

That seemed to satisfy the other fellow temporarily and then he broke out in another spot, by declaring that the trouble with self-feeders in general was that most of them were made only for water, and in the large sizes the sections were so heavy and unwieldy.

Promptly he stilled him on that complaint by saying: "This boiler I am talking about, this Newport Boiler, is made for both steam and water. And its sections are just half as heavy and half as unwieldy, because they are half the size.

"For the small sizes you string up a row of half sections. For the larger ones you simply pair them up, side by each.

"Any time any section breaks or any old thing or other happens that you have to have a new one, you can slip out the half of the section in trouble and slide in another half. Half the trouble, half the cost."

"But where is this Newport you are blowing so about made, anyway?"

"Heard to-day that Lord & Burnham are going to manufacture it and act as the Canadian distributors."

Being a boiler man myself, I promptly wrote the manager of that firm's boiler department, and asked him why in thunder he hadn't told me all about it long ago, as I wanted to be in on the ground floor by being the first to sell that boiler in our city.

His reply at that time was: "There isn't going to be any what you would call 'real ground floor.' Everyone is going to have an even start. The start starting with the page announcement appearing in the trade papers before next rent day rolls around."

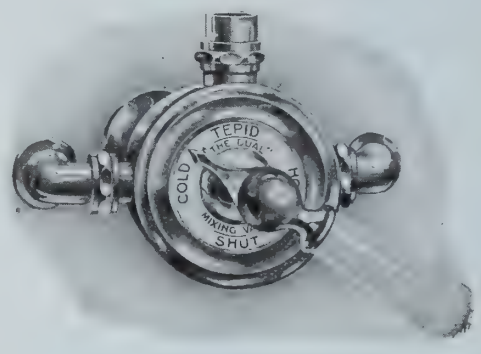
So, now I have told it to you as it was told me.

The moral attached is: Hearing without being seen is not eavesdropping. It's not your fault if two fellows talk loud on a railway train.

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EFFINGHAM BRASS WORKS, ROTHERHAM, ENGLAND

And at
9 Fenchurch St.,
London





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A valve that really mixes Hot and Cold Water, and maintains a uniform mixture.

For ease of operation, simple construction and easy installation, it has set a new standard of efficiency.

Cold Water must be turned on first, no possibility of scalding.

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Everywhere you install a "Pittsburgh" Automatic Gas Water Heater you banish for all time the worry and annoyance of waiting for hot water.

"Prompt service" hot water means satisfied customers—satisfied because they always have hot water as plentiful as cold, and nearly as cheap.

Many of the homes of your customers should have an Automatic Gas Water Heater, and probably the only reason they have not is because you have not tried to sell them one.

The best way to keep your shop busy this summer is to sell and install "Pittsburghs."

We have a series of attractive advertising literature that will make selling easy for you. This literature is yours for the asking. Why not write for it now?

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SANITARY ENGINEER
PLUMBER AND STEAMFITTER OF CANADA

Vol. XII. TORONTO, JUNE 15, 1918 No. 12

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EDITORIALS

Heating Engineers and Fuel Conservation—Business Building Policy

The MacLean Publishing Co., Limited

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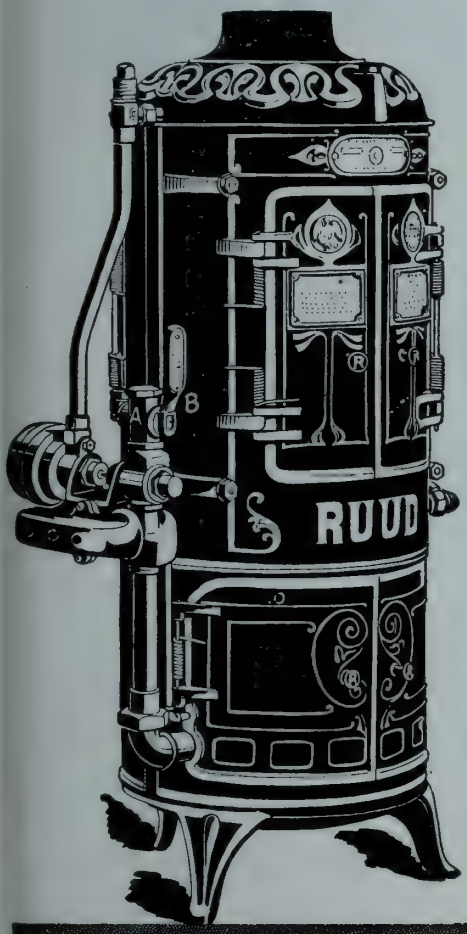
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TIE up to the Ruud Line and tie to quality that has been first for twenty years and will always be maintained. This Ruud idea has built the biggest and best water heater business in the country and is a fine proposition for master plumbers.

This war has given you a big merchandising and selling opportunity. If you'll take hold of the Ruud Line and push it with reasonable activity you can establish a permanent addition to your business and tie up to permanent profit. During 1918, or until normal general conditions bring back normal building conditions, you can cash in on Ruud quality and Ruud prestige. And when peace *does* alter the complexion of industry, you'll find yourself anxious to retain your identification with a genuine selling opportunity grown into a dividend paying *fact.*

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AUTOMATIC GAS WATER HEATER

Business Opportunities

THERE are 85,782 houses in the City of Toronto, and it's quite safe to say that at least 10% of that number are in need of new plumbing work and modern plumbing fixtures. What applies to Toronto applies with equal force to almost every city and town of any importance in Canada; and this business, neglected in building boom times, is now waiting for some good, live and progressive business men to develop.

There never was a time when money was so plentiful and so widely distributed as it is in Canada to-day, or a time when people bought so many luxuries and non-essentials, and there's no reason in the world why some of this money should not be spent usefully by equipping every home with modern sanitary fixtures and making every house a healthy habitation.

People would spend the money for this purpose if the facts were properly presented to them. Every owner knows that he can get more rent for his house if the plumbing is up-to-date, and every woman revels in the luxury of a nice bathroom. As a matter of fact there is nothing in building that offers so much convenience and comfort as good plumbing, but many people are afraid of the cost. Some one has told them that on account of the advance of raw materials and labor the price is prohibitive. It's up to the Master Plumber, the Jobber and Manufacturer to explain the true facts, to let them know that the price of good plumbing has not advanced in the same ratio as other commodities, and that a modern bathroom can be installed at a reasonable cost.

But one man can't do it. It's a job for everyone who would be interested and benefited, and every one should co-operate and concentrate their efforts with one particular object in view, and that object should be the dissemination of true information and the promotion of a bigger and better business.

Our Company would be glad to help.

Port Hope Sanitary Mfg. Co., Limited

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PORT HOPE, ONTARIO

Head Office:
ROYAL BANK BUILDING, TORONTO

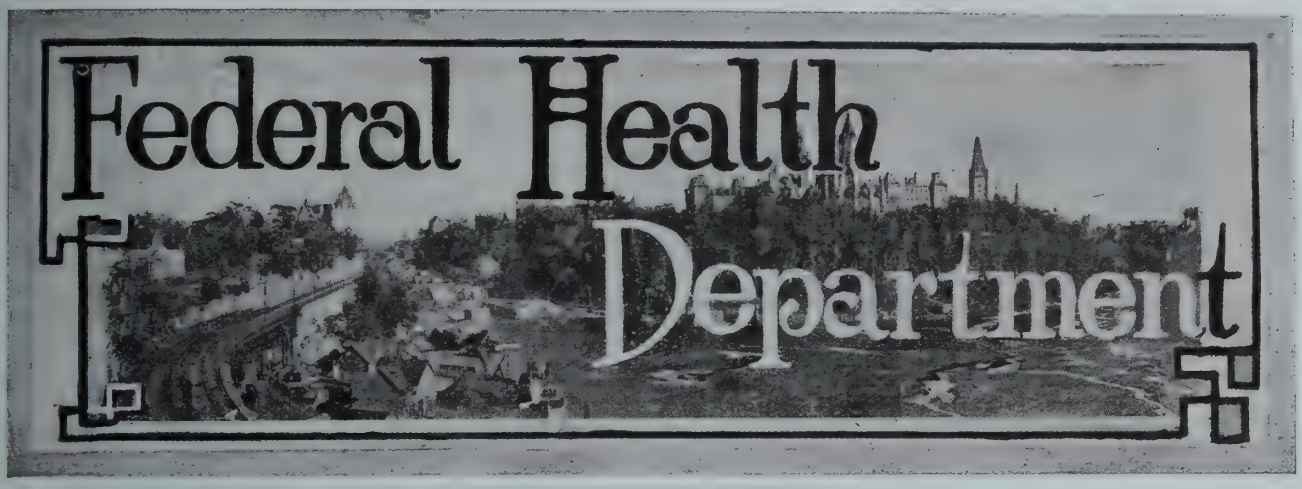
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SANITARY ENGINEER

VOL. XII JUNE 15 1918 No. 12



THE Toronto Branch of the Canadian Manufacturers' Association directs attention to the housing problem in Toronto and other industrial centres in Ontario in a vigorously-worded resolution which calls upon the Federal, Provincial and municipal authorities to consider means of relieving a serious situation. The resolution recites what is being done in Great Britain and the United States by public action, and points out that private enterprise has failed also to meet the needs in this country. It is suggested that the Ontario Government call a Provincial conference on housing with a view to collecting information as a basis for a practical program.

The elementary work of housing reform consists in the exercise of the police power of the State in the administration of health laws and building codes. This preventive work is very important, and is doubly so when directed, as in Toronto, by administrators as able and public-spirited as Dr. Hastings and Mr. Pearce. In the present crisis, however, the tendency is rather to relax regulations than to increase their stringency. This is shown by the frank admission of the Health Department that 2,000 houses in Toronto should be condemned as unfit for habitation were there any other accommodation available for the occupants.

This question is one no doubt which will require some serious consideration. But why are houses scarce in almost every Canadian city as well as Toronto? There is a reason: and why should there be at this period a shortage of houses?

Simply because almost every rural and farming community have decreased in population. Thousands of farm help and farmers' sons have left the farms and are right now engaged in making munitions, or in filling the places of the city men that have gone to the war.

Thousands of the returned men will take up land and become farmers, and farmers' sons will return home, and both will feel the need of city conveniences. Yes, and they will demand them or else they will return to city life.

SANITARY ENGINEER has repeatedly advocated that a federal department of health be formed by the Federal Government, and now there comes along a frank admission that cities like Toronto are becoming too unwieldy. There are too many problems to deal with when people begin to crowd into small rooms. Relief must be sought on the constructive side of the problem. According to the housing experts the chief factors are: (1) Construction of housing accommodation; (2) town planning, having in view economic development and the preservation of the amenities of the neighborhood for residence purposes; (3) tax reforms to bring about the elimination of speculation in land by reserving to the community virtually the whole of the increment of value; (4) transportation.

In 1913, the last year of active building operations before the war, $12,873,000 represented the value of new houses erected in the cityof Toronto. It is evident that the housing problem is large and complicated, and that the financial side assumes formidable proportions. Where will the money come from? Decent housing is essential to decent citizenship, to social progress, and to industrial efficiency. When private effort fails, the public authority must take the matter in hand. Great Britain is the most profitable field for a study of the subject. She has far surpassed other countries in every branch of housing betterment. We need machinery corresponding to the Local Government Board in the United Kingdom. Perhaps the Toronto branch of the Canadian Manufacturers' Association had this in mind in urging the Federal Government to emphasize and enlarge the housing and town-planning section of the Conservation Commission of Canada.

The following quotation is taken from the Toronto *World* of a recent date. The figures are astounding when one realizes that thousands of Toronto men enlisted and also that in the year 1915 it was estimated that there were over 8,000 empty houses in Toronto:

"In spite of the great drains made on Toronto's population through enlistments in the army, the population has steadily increased, while on the other hand the supply of houses has not commenced to keep up to the demand. The following table showing the city's population, number of buildings erected and their value contains information, published for the first time in this form, which gives a clear idea of how the housing problem is rapidly becoming more serious.

			Dwellings Built	
Year	Population	Inc.	No.	Value
1905	238 642	12.597	2.691	$ 4,849,751
1906	253.720	15 078	3.470	8.038.340
1907	272 600	18 880	3.273	7.570.550
1908	287.201	14.601	2.955	7,264,555
1909	325 302	38 101	4.064	10.198.430
1910	341.399	16 097	4.873	11,409,137
1911	374 667	33.268	5.437	12.400.310
1912	417.250	42 583	5.675	13,490,185
1913	445 575	28 325	5.089	12.873,117
1914	470.144	24.569	3,919	9,394,612
1915	463.705	7.439	832	2.213,340
1916	460.526	3.179	657	1.647,415
1917	473.829	13,303	926	2,195,700

Five Per House

Last year, according to the figures proposed by the assessment department there were 85.782 houses in Toronto, and the number of stores, mostly with dwellings above them, were 8.360, making 94,-

(Continued on page 18.)

Tests and Designs of Air Lift Pumps

The Air-Lift Pump Has Become One of the Most Economical Methods of Raising Water—The Simplicity of Construction and Almost Entire Absence of Moving Parts a Unique Feature

By A. W. Purchas*

The comparison and analysis of published tests will be greatly simplified, if some standard form can be adopted. Most of the published tests lack certain important items, and other information, such as the submersion, is given in different ways, so that their analysis requires considerable work.

The author has adopted what he believes to be the most convenient form, and one which includes all details necessary to examine the behavior of the pump itself. The observations might, of course, be extended to include every part of the plant down to the fuel consumption, but such details can be foretold with fair accuracy by the manufacturers of the compressor. Since efficiencies of 80 per cent. seem possible with the air-lift pump in the near future it would not seem inopportune for some authoritative body to outline a method of making and recording tests of the air-lift pump, and its reverse the entanglement type of hydraulic air-compressor.

Probable Accuracy of the Tests at Oilfields

Lift.—This was measured within one foot equipment to 0.4 per cent., and did not vary more than 1.5 feet during any one test.

Quantity of Water Pumped.—The depth in the measuring tank was recorded by three independent readings to the nearest eighth of an inch, which is equivalent to:

8.7 cu. ft. in	2.652	or 0.33%	in Test 1	of Series	A
" "	1,284	" 0.68%	"	"	B
" "	1,458	" 0.60%	"	"	C
" "	2,340	" 0.37%	"	"	D

Revolutions of the Air-Compressor.—The probable maximum error would be 5 in 7,750 in Test 8 of series D.

Volumetric Efficiency of Compressor.—The probable error in measuring the volume of air flowing through the orifice during the tests of series D is not more than 2 per cent., as the pressures and temperatures were all recorded within this margin. The values assumed for the tests of series A, B, and C, were based on the experiments made in April and May, 1914, taking into consideration the following :

(1) The speeds of the compressor.

(2) The known condition of the air-valves and guides.

(3) The volumetric efficiency shown on the indicator cards.

(4) The temperature of the air in the compressor suction pipe.

(5) The known condition of the scale in the cooling jackets, and the quantity of cooling water supplied. The cooling water was supplied by a piston pump driven direct from the compressor crank-shaft, in all cases.

It is difficult, therefore, to form a definite opinion of the probable accuracy of these latter values.

Indicated Horse-Power.—The maximum difference between the highest and the lowest "mean effective pressure" recorded during any one test, for the same end of a cylinder was 1.3 per cent. for the low-pressure cylinder, and 1.8 per cent. for the high-pressure. Considering the attention paid to details in the use of the indicator and the low speed of the compressor, the probable accuracy of the values given for the indicated horse-power is within 1 per cent.

Theory of the Air-Lift Pump

This subject is here treated in the following sequence:

(1) Design of air-injection foot-pieces.

(2) Nature of the rate of change of velocity of the mixture to the eduction-pipe.

(3) Operation of the pump as a whole.

(4) Submersion of the injection foot-piece.

Foot-Pieces.—The design of the foot-piece does not play such an important part in the ultimate efficiency of the pump, provided:

(1) That the fundamental laws of the losses in transmission of air and water are carefully kept in mind, when designing; and

(2) That the air is injected into the water in the form of small bubbles.

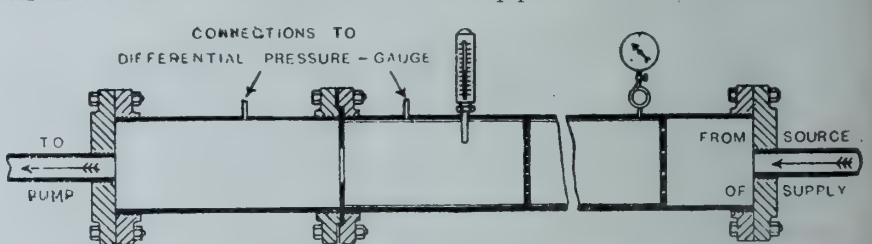


FIG. 6. HIGH-PRESSURE AIRMETER ORIFICE TYPE.

Any attempt to use the injector principle is pure waste of time, and generally leads to throttled air and water passages, and a back pressure on the air of two to five pounds per square inch, which represents so much wasted energy, for which no corresponding gain can be shown elsewhere. This throttling effect is very marked in the tests by Messrs. Brown and Behr, which were made with an inch diameter air-line terminating in a ⅝-inch diameter nozzle. Some of the tests by Messrs. Davis and Weidner show the same fault.

Fig. 1 shows the foot-piece used by the author in the tests of series A. Its obvious fault is the contracted water-passage, and its only excuse is its cheapness. The real reason that this was abandoned was the choking of the bottom of the air-pipe with rust and scale, so that eventually it caused an additional air-pressure of 30 lb. per square inch. Alternate exposure to warm air and water will corrode steel at an extraordinary fast rate. Before putting the eduction-pipe back into the well, after discovering this trouble, the "eddy cone" was removed, and series B of tests was made with the foot-piece shown in Fig. 1A. The foot-piece shown in Fig. 2 was originally used in Well No. 1, the aim being to inject the air in the form of small bubbles. This type suffered from the same faults as the previous ones. Series C of tests was made with the type shown in Fig. 2A.

When Well 2 was last re-tubed, it seemed probable that the eduction-pipe then inserted would be the largest ever required, and therefore full advantage was taken of previous experience and first cost was not so important. Fig. 3 shows the design of the resulting foot-piece, and this is the type used in series D of tests. The following points were aimed at in the design:

(1) To avoid loss of air-pressure in transmission from the well-head to the foot-piece, and keep the air-pipe outside the eduction-pipe without resorting to the use of the annular space around the outside of the eduction-pipe. An air-pipe run inside the eduction causes additional frictional losses in the rising mixture, with no corresponding gain elsewhere.

(2) To provide a pocket to catch such scale and rust as may form in the air-pipe, and thence fall into the foot-piece.

(3) To introduce the air into the water in the form of small bubbles, as it has been claimed that the velocity of slip of an air-bubble through water varies as the square root of its volume. Since designing this foot-piece the author has found that Mr. Joseph P. Frizell, member American Society of Civil Engineers, outlined the same type of foot-piece in 1880, and in "Engineering News" of 8th June, 1893, referring to

the reverse process of compressing air by entanglement with falling water, wrote: "This method was suggested by observing the very moderate velocity with which bubbles of air rise in still water, the velocity varying with the size of the bubble, from nine inches per second or thereabouts for minute bubbles such as result from a slight agitation of the water, to as many feet per second in the case of great masses of air."

Mr. Kenneth Allen, describing the equipment and tests of the wells under his charge at Atlantic City, U.S.A., in a paper read before the Engineers' Club of Baltimore in 1908, also from his experience supports the same.

Mr. Edmund M. Ivens, on page 143 of his book, "Pumping by Compressed Air," writes: "The small openings mentioned divide the air bulk into small streams and thoroughly aerate the column. Considerable gain in economy over other systems is realized thereby, as may be seen by comparison of the curves and tables."

(4) To provide orifices for the air that would not corrode and choke up, as did those drilled in steel and used in the foot-piece shown in Fig. 1

(5) To so proportion the water passages that there should be no sudden change in the velocity of the rising column. The water-passage at the bottom is 6 inches in diameter. From this point upwards the passage gradually contracts, and the water therefore is gradually accelerated until it reaches the bronze taper-nipple. As the water rises through this, it is assumed that the air is uniformly admitted through the 120 ¼-inch holes, and that the velocity of the mixture is constant. Beyond this nipple the velocity of the mixture gradually increases until the size of the eduction-pipe is increased.

(6) To provide some form of guide on the lower end of the foot-piece as shown in Fig. 1, to prevent its catching in the joints of the well casing when being lowered into the well.

There is no necessity for the foot-piece to be as long as that shown, unless it is so built as to form an auxiliary air-reservoir at this point; a feature which has some advantages. It is equally possible to combine all the above points with the exception of No. 1 in a foot-piece to be used on an air-line inserted inside the eduction-pipe, and this latter construction is sometimes necessary if the well casing be small.

Velocity of the Rising Mixture

The air in the eduction-pipe expands as it rises, due to the diminished head of liquid above it, and it may safely be assumed that it does so isothermally on account of the large volume of water by which it is surrounded. In the case of a single bubble of air rising through water, the pressure on the bubble will vary directly as the head of water above it. In an air-lift pump in operation the air-bubbles are rising through a mixture of variable density, since the ratio by volume of air to water per foot length of eduction-pipe increases as the outlet is approached. Under these conditions the pressure in the eduction-pipe will vary as the ordinate to a hyperbolic curve, and the volume of each bubble as the ordinate to a straight line.

To find the volume of air passing any point in the eduction-pipe per unit of time:

Let P_1 be the absolute pressure of the atmosphere.

P_2 be the absolute pressure, equivalent to the head of submersion of the foot-piece.

V_1 be the volume of air delivered per second to the pump, measured at pressure P_1, and a temperature equal to that of the liquid being pumped.

x be the distance of the point under consideration above the point of air injection in feet.

L be the distance in feet from the point of air injection vertically to the outlet of the eduction-pipe.

The same weight of air, and likewise the same weight of water must pass each point of the eduction-pipe per unit of time; the volume of air flowing per second through the outlet of the pump is V_1 cubic feet, and the volume of air entering the eduction-pipe during the interval is $V_1 \frac{P_1}{P_2}$. The increase of volume of the air in ascending the eduction-pipe is—

$$V_1 \left(1 - \frac{P_1}{P_2}\right),$$

and the total volume of air passing the point under consideration per unit of time is—

$$V_1 \frac{P_1}{P_2} + \frac{x}{L} V_1 \left(1 - \frac{P_1}{P_2}\right).$$

The sum of the volume of air and water passing per second being thus found and cross-sectional area of the pipe being known, the average velocity can be calculated. This average of what is in some cases a widely varying quantity is the only value that can be calculated, and forms a very valuable deduction in analyzing the results of tests and in designing the pipe for a new installation. In cases where the air is injected in the form of small bubbles, and the pump is run at or over its most economical capacity, the velocity at any point appears to remain fairly uniform, and as has been pointed out above, these conditions should exist in a well-designed pump; therefore the average velocity calculated by the above method will be a close approximation to the true value.

THE loss of heat conductivity in a boiler due to soot on the heating surface has been calculated at 9.5 per cent. for a layer of 1-32 in. of soot, 26.2 per cent. for 1-16 in. layer, 45.2 per cent. for ⅛ in. layer, and 69.0 per cent. for 3-16 in. layer.

MUST HEAT PREMISES

"In a judgment handed down recently by Mr. Justice Guerin in the Superior Court, His Lordship confirmed the principle that a proprietor is bound to maintain, in a state of effectiveness, a complete system of heating in premises which are rented as dwellings, otherwise he may be condemned to pay damages incurred by his tenant and have the lease annulled."

The Heating Apparatus

We would infer from the above that his honor referred to the heating apparatus, and if such stand was to be taken in most of our Canadian cities, the bulk contractor, speculative builder, as well as the average architect would take greater care in specifying the type of heating systems that at present are being chosen. Very few buildings are equipped with efficient heating systems these days, which is to be regretted, particularly when we consider not only the waste of fuel, but also the inconvenience, suffering and discomfort which is the direct result of poor heating systems being installed in our buildings.

WORKINGMEN'S HOUSES AT BRANTFORD

A tract of land, some 35 acres, situated off Dufferin avenue in Brantford, has been secured by the Dufferin Parks, Limited, of which the Dominion Steel Products Company is the holding company. On this tract, which will be laid out on plans prepared by H. Dunnington Grubb, landscape artist and town planner, 100 new homes will be erected, with all conveniences, and at a minimum cost of $3,000 each. These homes will be sold to skilled mechanics who have been employes of the company for at least a year, on easy terms of payments and at practicall ycost, plus carrying charges. The move is part of a plan to secure from 600 to 700 skilled machinists for the Dominion Steel Products Co. by offering homes for the best type of artisan citizens. It will mean the spending of $450,000 on development, and as a partial result within thirteen months the sum of $2,000,000 will be paid out in wages from this plant. The houses will be built from twenty different designs, and will be constructed in some cases of brick and in others of tile and stucco. It has been stated that these houses will be heated from a central heating plant and that a charge will be made for this service based upon the condensation from the returns. It would therefore appear, that each house will be fitted with steam radiation, and a meter to check the condensation as it returns to the main return lines. The fact that these homes, built in the way they are to be built, and to cost $3,000 each, leads one to think that the houses will not be gotten up cheaply as is the case when dwellings are built by speculative and bulk contractors.

What Is a Vacuum?

The Vacuum Simply Explained — Why it is Useful in the Sanitary and Heating Business—Atmosphere Has Weight—A Vacuum is That State When Atmospheric Pressure is a Local Non-Existent

SANITARY and heating engineers are becoming more and more interested in the laws of physics, vacuum steam systems, vacuum cleaners and all manner of appliances that operate and render vacuum service are being installed by members of the trade. The following explanation will therefore be doubly interesting to many of our readers.

To explain this question a few familiar technical points must be discussed. Atmosphere is a gas, and may contain a number of chemical properties according to the local surroundings or industries located. It has weight and is highly compressible.

Because of this weight it exerts a pressure, which, at sea level, is equal to 15 lbs. pressure per square inch, and as it is compressible, it is also subject to a vacuum.

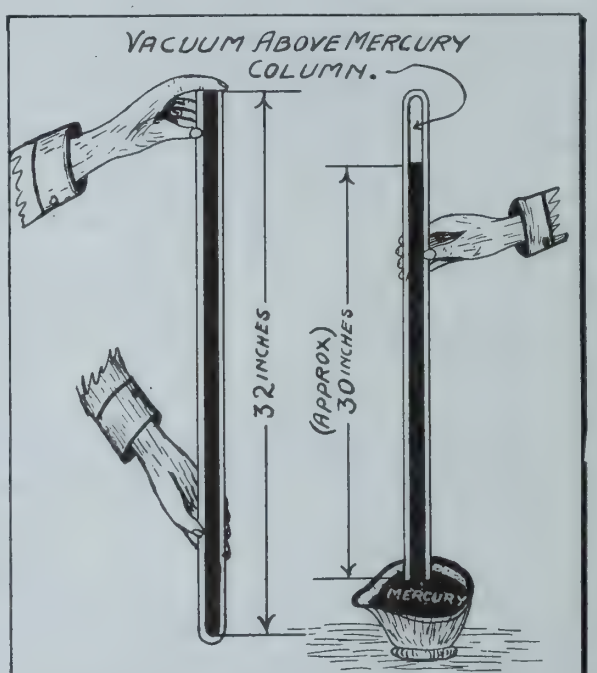
If, for example, a tube 32 inches long, closed absolutely tight at one end, be filled with mercury, and after placing the finger over the open end the tube is inverted and the open end submerged in a vessel containing mercury, it will be found that the column of mercury will drop a short distance, but its upper surface will be approximately at a height of 30 inches above the level of the mercury in the vessel.

The space between the top surface of the mercury and the closed or upper end of the tube is a perfect vacuum, being devoid of any air, and consequently it exerts no pressure.

Since there is no pressure above the top surace of the mercury column it follows that this column must be balanced by the pressure of air acting on the surface of the mercury in the vessel, that is to say, 30 inches of mercury is equal to about 15 lbs. per square inch of atmospheric pressure. The actual height of the mercury column is not necessarily 30 inches but varies more or less according as the pressure of the atmosphere varies. The vacuum just referred to is designated as a 30 inch vacuum. If a very fine hole be made in the top end of the tube and air is admitted in very small amounts at a time it would be found that the height of the mercury column would decrease each time that a little air is admitted, and if a small vacuum gauge had been fitted to the top of the tube and air admitted at a point above the mercury, then the gauge would indicate the actual vacuum at various stages. The perfect vacuum above is more and more impaired by the addition of air, and a greater and greater pressure is exerted upon the column of mercury until finally the pressure above the mercury becomes equal to that of the atmosphere and the column of mercury equalizes or falls to the level of the mercury in the bowl.

As the pressure above the mercury is increased from zero pounds per square inch (perfect vacuum) to 15 lbs. per square inch (atmospheric pressure), as just explained, the mercury column assumes decreasing height, and the vacuum above the mercury, now more properly termed a partial vacuum, is measured by the corresponding height of the column of mercury. Thus, if the mercury column stood at a height of 6 inches the vacuum would be known as a 6 inch vacuum, while if it stood a height of 18 inches it would be known as an 18 inch vacuum, and so on. The actual or absolute pressures for these two vacuums would be about three and nine pounds per square inch respectively.

In a vacuum cleaner a partial vacuum is maintained continuously by some mechanical means. In a vacuum heating system the vacuum is maintained intermittently by the contraction or condensing of steam that has previously displaced a body of water.



EXPERIMENT, CREATING A VACUUM WITH GLASS TUBE AND MERCURY. EN

Just let us explain how a vacuum will cause the collapse of boilers or expansion tanks. Some years ago a number of repairs to some 3-inch tube coils had to be made to a heating system in a large dry goods store. It was an old system, and a one-pipe system at that. The fitter not being quite sure to which of the risers these coils were connected, closed every gate valve at the foot of each of all the risers. This job was being done at night when the store was closed, and there was about 10 lbs. of steam; the fires were drawn and no fear of any further steam being generated.

Work went on upon the upper floors, and about six o'clock next morning the job was ready for steaming up. It was found that one of the side sheets in the boiler had collapsed. This was caused by the condensing of the steam and cooling of the water. The water contracted when it cooled and the steam condensed; therefore, instead of a 10-lbs. pressure, there was a vacuum, and the 15 lbs. atmospheric pressure being withdrawn or expended, there was no interior resistance to the 15 lbs. atmospheric pressure on the outside of the boiler.

If sanitary and heating engineers could for the purpose of study always take for granted that air is a compressible solid, and will support bodies of any weight or magnitude, providing it is enclosed, they would grasp more easily the laws of physics.

Now let us turn to the expansion tank on a hot water system; there were quite a number collapsed during this last winter. The reason was that the water in the tank became warm, and a warm vapor was thrown off the water up the vent, and when this vapor came in contact with the ice-cold pipe extending through the roof the moist vapor froze and gradually closed up the vent. Then when a warm spell came or the fire got low the water contracted and created a vacuum. This was merely the fact that the water in the system being hot at one period, contracted, and in first expanding this water had exerted or thrown off a vapor which just overcame the atmospheric pressure for a short period, until the frost at the vent had closed it up, and being closed, there was no inside resistance to overcome the outside atmospheric pressure of 15 lbs.

If our readers will take a little time with their apprentices in the shop and devote this time to easily conducted experiments, they as well as the boys will

(Continued on page 23.)

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HEATING ENGINEERS AND FUEL CONSERVATION

IT is scarcely possible to pick up a daily paper these days that has not something to say about fuel conservation, or warning the public to lay in their stock of coal, etc. But how many ever try to show how two tons of coal can be made do the work of three tons? It might be stated that that is a technical problem, and one that could not be discussed intelligently in a daily paper. That is not so by any means. A daily paper can discuss any subject in a plain way so as to be easily and intelligently understood.

It need not delve into technicalities, but simply base its arguments upon technical facts. For example, if a heating engineer was to begin and use a flow of highly technical phraseology when trying to make the sale of a hot water or steam heating furnace, the chances are that prospective customer would be apt to declare that "such a complication of arguments led him to think that after all the old pot stove beat the lot." Such a decision was actually arrived at some time ago when a certain heating engineer tried to show a farmer how much superior a furnace that he, the leading engineer, handled was than one which the farmer had had recommended to him by a friend of his.

Such an incident proves conclusively that heating engineers should avoid using too many complicated or technical terms when selling a hot water or steam furnace, and it also proves that the daily papers could discuss intelligently how fuel could and should be saved, the first step being that the furnace is of a reputable make, that it is large enough to heat the building, and when we say large enough we must have in our minds not only the cubical contents of the building, but also what type of building it is, and whether it is wind and weather proof.

It would be a very conservative statement to make if we said that over one million tons of coal are wasted directly as a result of poorly installed furnaces, or furnaces that are too small, and it would be within the mark if we stated that at least 10 per cent. of all the furnaces and radiation installed already is responsible for 25 per cent. to 30 per cent. waste, which would mean that if every heating engineer in Canada were to find out where these undersized furnaces were, then get after the owners to have larger furnaces, a big saving in fuel would result and lasting friends be made and new business created. We venture to say that right at the very door of every reader of SANITARY ENGINEER there are furnaces installed that are too small, that require the attention of some practical man, and by calling upon the owners of these furnaces a heating engineer would be doing his country a practical service in being the cause of conserving fuel, and at the same time be receiving remuneration for so doing.

We believe that urging owners of furnaces to have them fixed up and more radiation or larger furnaces installed would be a far better move than doing as the daily papers are, advising every householder to lay in a big stock of coal. The former advice would do a great deal towards assisting the transportation problem and the country's trade balance, while the latter advice tends to cripple, or make transportation a more difficult problem to handle and at the same time assists to carry on the big waste of this continent's natural and most valuable resources.

BUSINESS BUILDING POLICY

ONE of the most important questions which the people of Canada are confronted with next to winning the war is the housing problem, with a close second that of fuel conservation. In connection with the housing problem there are one or two matters which are directly of interest to every sanitary and heating engineer, and in such a way that if he will bestir himself he will reap a lasting benefit and not be forgotten by those for whom he works.

For instance, most of the houses that will no doubt have to be erected very soon will be built by speculative builders, in many cases the bulk contractor will get in on such work. Now the thing to avoid is cheaply gotten up specifications, poorly laid out plumbing installations and heating systems that will be too small to heat the building. The average sanitary engineer will be called upon to skimp here and there, to lay out his work cheaply at the expense of efficiency, and as we stated before to use cheap goods, and, when such cheap appliances are laid out and installed, the future owner or tenant will be put to all manner of inconvenience. This will result in these owners or tenants making inquiries as to who installed the goods, etc., and a bad impression will at once be given them of the character as tradesmen as well as mechanics of those who put in the work.

We have on the whole far too much repair work to do, and this proves that the quality of work and material or design of the installation has been defective in some way or other. This should not and

would not be if members of the trade would stand out for their price and refuse to instal inferior material.

The question may be asked, how can the layout of a plumbing system be cheapened, etc.? By installing piping on exposed places, by lack of provisions to prevent freezing, by installing waste pipes in cold places, and when unavoidably so not providing adequate covering, etc. Or, when a bath-room is being laid out, it may cost a little more if fixtures are placed certain ways. Then the inconvenience and annoyance to the dweller is at once realized. Sometimes the kitchen sink while convenient to the soil pipe may be very inconvenient because of its location in the kitchen. Then, there are certain types of brass goods that look all right, and may in a general way be O.K., but there are also brass goods that have a number of features embodied in them that make for long life, hard wear, and are easy and cheap to repair. Some take a long time to fill a kettle, etc. Others splash all over the sink or fixture, and to explain to the bulk contractor or jerry builder why better fixtures should be used would be wasting good time and about on a par with fattening hogs on strawberries and cream.

All that is required is that sanitary and heating engineers have a little more backbone, demand better prices and instal goods that will last, and give lasting service. Unless such a stand is taken there will be little hope of the trade ever earning that lasting public good-will so very desirable to the welfare of every member of the craft.

The Spirit That Wins

Her Son's Star Was There—The Story of a Mother, Her Son's Star—It is Just Such Mothers, Such Sons and Such Concerns That Make This Good Old World a Better Place to Live in

SHE stood in front of the Crane building in Michigan Avenue looking up at the big service flag. She seemed to be trying to count the 800-odd stars on it. Presently she came inside and spoke to the man at the information desk:

"Is there a star on that flag for every man who has gone from Crane Co's employment into the service of the country?" she asked.

She was told there was.

"Then my boy's star must be there. He worked for the —— branch and enlisted soon after we went into the war. Can you tell me for sure if my boy has a star up there?"

The man at the desk led her to the printed list of the Crane roll of honor, where, under the branch house classification she read the name of her son, pointing it out to the man. And the man said: "Yes, madam, your son's star is up there with the rest."

She was silent for a time, then, more to herself than any one else in particular, she went on:

"It's wonderful, simply wonderful, the way you are looking after the boys who leave you for a time to fight for our country and our country's cause. You print their names where every one may read them. You put stars on a flag for them. You send them 'comfort kits' and magazines and you write them cheering letters and help them to pay their insurance. It's just wonderful.

"You see, my boy—well, he is all I have and naturally I deeply appreciate all that you are doing for him. I take it as though you were doing all this just for him, you know. And when I saw all those stars and the name 'Crane Co.' on the building, I couldn't resist the impulse to come in and speak to you about my boy and give you a mother's thanks for you interest in him.

"Of course it is lonesome for me now that he is away over in France. I spend many anxious and prayerful moments, but I wouldn't have it any other way for the world. It is right that he should be there and that I should wait for him to come back and pray for him while he is away. That is a mother's way of doing her duty, you know.

"And when I get so lonesome and anxious that I am restless, I just walk down to the branch where he worked and sit among his fellow clerks there and do a little knitting or sewing, make myself as little of a disturbance as possible, you understand, and get much comfort and help by sitting near where he sits when he is back home and at his daily work.

"The boys are all so kind to me, so thoughtful, and they do me so much good, for they listen as I talk about my boy and do not appear to be bored, as some folk do when a mother speaks of her only son.

"This has been a wonderful treat for me to have seen my boy's star on your big flag and read his name on your roll of honor. I'll think of this when the days seem long and a bit 'blue,' and when I go down to the office back home and they let me sit in my boy's old chair and think of him, over in France."

She left with a gracious good-bye, and there was something akin to moisture in the man's eyes as he held the door for her to pass out. Her name? What does her name matter? She will read this as she thinks of her boy, and he will read it over in France as he thinks of his mother. This is simply our way of telling the boy that his mother from "somewhere in Iowa" gave us the very great honor and pleasure of meeting her, and of being inspired and heartened by her quiet courage and wholesome womanliness."—From *Valve World.*

FEDERAL HEALTH DEPARTMENT

(Continued from page 13.)

142 places of residence. This figured that the population averages about five a house. That being the case the supply of new houses has been steadily falling short of supplying the needs of the increase in population."

We believe the solution to the problem is the "back to the land movement," and such a move, properly regulated, would mean increased business for sanitary and heating engineers, simply because there would be more appliances required on a farm or in a rural home than is the case of a city home.

There is a septic tank extra, a pneumatic water supply system, and sometimes a double system for hard and soft water.

Then there is the question of lighting, where there is no hydro power at hand. This would mean either a small gas generating plant or an electric generator, etc., and without doubt, given all these appliances, fewer farmers would leave the country to seek conveniences in city life.

Waterworks, Sewerage, Etc.

Renfrew, Ont.—The construction of a sewer in Plaunt Park, is contemplated by the Town Council.

Thorold, Ont.—The Town Council has authorized the laying of 300 feet of sewer with laterals.

York Township, Ont.—Tenders have been called for the construction of 270 feet of 12-inch sewer on Eaton Ave.

Brooke Township, Ont.—The City Council contemplate drainage construction and road repairs costing $15,800.

Sedgewick, Alta.—The Town Council contemplate the construction of three concrete reservoirs costing $7,000.

The Importance of Expansion Tanks

Not Sufficient Thought Given to the Expansion Tank in a Hot Water Heating System —Many Heating Engineers Simply Install Them Because Their Father Before Them Did So—Too Often it is Hidden Away Out of Sight

ONE of the main reasons why we are describing various methods with regard to expansion tanks by persons engaged in the heating trade is in order to show what sometimes happens when the owner of a house does not know what an expansion tank is for, or how it should be dealt with.

For example, a case occurred some time ago where a man thought he would pay a little more attention to the heating system of his house than he had previously done. He did not recall ever cleaning the furnace out, neither the water nor the soot. So he set to work and made what he thought was a good job of it.

Someone told him that in emptying the water out he would simply have to open a stop cock which would be found at the bottom of the furnace somewhere. This he did and the water of course all ran out. He was told that to fill the furnace would take longer, but all he need do was to turn on the water at a valve "somewhere near the furnace." "Well," thought he, "I'll wait till the fall and fill the furnace when I begin to fire up," and he did. He ran the water half way or more up the water glass at the expansion tank and fired up. There being no overflow pipe connected to the top of the tank, as shown in Figs. 5 and 6, the water was forced up the vent and over the roof.

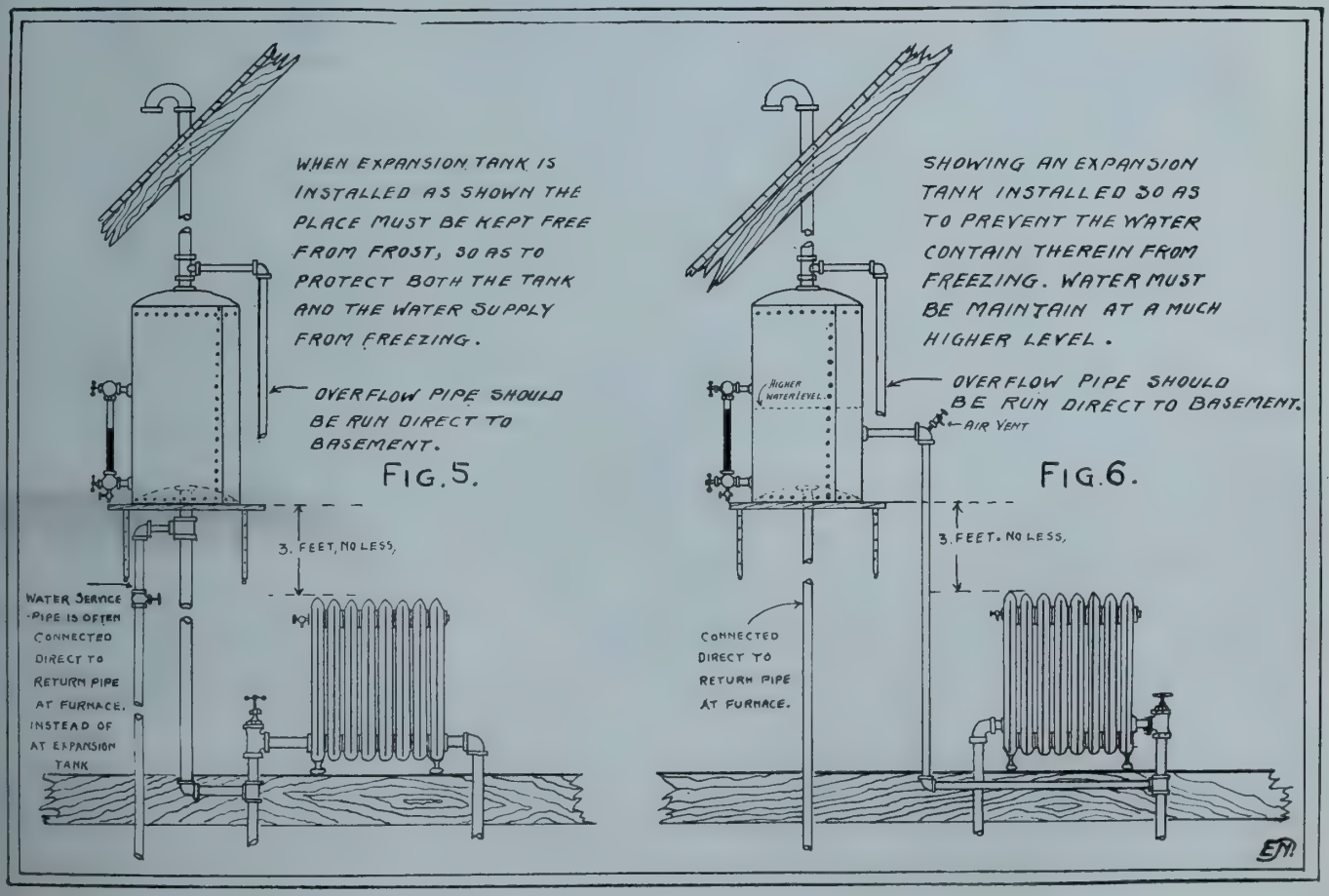
Another case which came to the notice of the writer was where some impractical person had advised a householder to turn on water every once in a while to put water into the system. He found, however, that when he did this that the water ran down through the overflow pipe. Not knowing, however, that this pipe was the overflow, he decided to plug it up; as it happened the end of the pipe had a thread on, so he procured a cap. All went well and he stopped running the water into the system, until the expansion tank burst, it only being made of sheet galvanized iron, which was fortunate. The vent through the roof was full of water and had frozen. The pressure generated caused the damage. Now, it is just such cases which prove that the public should be given full instructions and not only in printed form but personally.

One thing certain is that no valves of any kind that are apt to be turned on or off should be placed on the expansion pipe. It will be noted in the illustrations which accompany these articles that all expansion pipes are free of valves.

The two cases mentioned would not have happened if the occupants or the persons operating the heating systems had been given specific instructions. This advice has been previously referred to in former articles. It should be pointed out that the average hot water heating system has more pressure on it than is the case with steam, and that this pressure is necessary to create a more rapid circulation.

Another question arises in the minds of many who are just entering into the heating business, and that is whether the use of a temperature booster or heat generator is really of value to a hot water heating system. Of course it has long been proved that to increase the pressure in a hot water heating system not only increases the temperature but also creates a more rapid circulation, and such being the case all hot water systems would be improved if a slight constant pressure were exerted in some way or other. The greatest problem when such appliances referred to are used is to make sure that an effective valve in the apparatus will allow the water to return through a sort of by-pass, else a vacuum would be set up and the expansion tank would collapse.

(Continued in a future issue.)

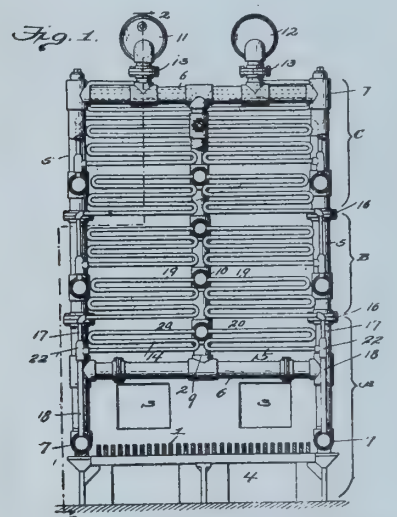


New Canadian Patents

No. 181,697.

Horace Furman, Petersburg, Virginia, U.S.A., 22nd January, 1918; 6 years. Filed 19th November, 1917. Receipt No. 287,796.

Claim.—1. A steam boiler comprising a steam drum, outer water manifolds, water tubes arranged in units at opposite sides of the vertical center of the boiler and connected at their outer ends to receive water from said outer manifolds, intermediate manifolds arranged between the outer manifolds and connected to the inner ends of the water tubes to receive water therefrom and to support the inner ends of the water tubes, and risers for the outer and intermediate manifolds



No. 181,697. Steam Boiler.

connected to one another and to the steam drum.

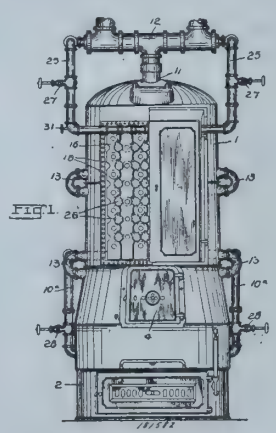
2. A steam boiler comprising a steam drum, horizontal outer manifolds, water tube units arranged in vertical rows at opposite sides of the certical center of the boiler, the units of each row being connected to receive water from the respective outer manifolds, central horizontal manifolds connected to the inner ends of the units of both rows, and vertical circulating pipes for the outer and central manifolds connected at their upper portions to one another and to the steam drum.

3. A steam boiler comprising horizontal outer water manifolds connecting them, vertical rows of water tube units, the units of each row being connected to the manifolds at the respective side of the boiler, intermediate horizontal water manifolds connected to the inner ends of the water tube units, and vertical manifolds connecting said intermediate horizontal manifolds and connected at their upper ends to the vertical manifolds for the outer horizontal manifolds.

4. A steam boiler comprising a plurality of superposed sections, each section comprising an outer horizontal water manifold, water tube units connected to receive water from such units, an inner water manifold connected to receive water from such water tube units, and sectional vertical manifolds having their upper ends connected to one another and connecting respectively the outer and inner manifolds.

5. A steam boiler comprising a plurality of superposed sections, each section comprising a pair of horizontal outer water manifolds, parts of vertical water manifolds, water tube units connected to receive water from the outer horizontal manifolds, inner horizontal water manifolds arranged between the outer manifolds and connected to receive water from the water tube units, parts of vertical water manifolds connected to said intermediate horizontal manifolds, and means connecting the upper ends of the vertical manifolds for the outer and inner horizontal manifolds.

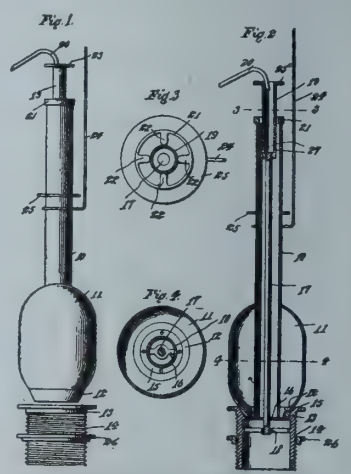
6. A steam boiler comprising vertical water manifolds divided into sections, means detachably connecting such sections, outer horizontal water manifolds connecting the respective sections of the vertical manifolds, sets of water tube units connected to the respective horizontal manifolds to receive water therefrom, inner horizontal water manifolds arranged between the outer horizontal manifolds and connected to the water tube units to receive water therefrom, vertical water manifolds divided into sections, the sections being connected to the respective inner horizontal manifolds, and means connecting the upper ends of the vertical manifolds for the outer and inner horizontal manifolds.



No. 181,582. Furnace.

Joseph Achille Francoeur, Montreal, Quebec, Canada, 15th January, 1918; 6 years. Filed 27th April, 1917. Receipt No. 279,025.

Claim.—1. The combination with a furnace having an outer casing, a firebox located within the lower end of said casing, a fume outlet located at one side of said casing, brackets arranged within said casing, a plurality of closely adjacent and vertically extending casings supported upon said brackets, the opposite side walls of said casings having recesses therein whereby when the casings are placed adjacent to each other said recesses will provide draught openings, caps for closing said openings, a plurality of tubes connecting and communicating with said casings, smaller tubes passing through said casings and said first-mentioned tubes, a supply pipe, branch pipes connecting said supply pipe



No. 181,531. Flush Valve.

with said casings, an outlet pipe, and branch pipes connecting said casings with said outlet pipe, substantially as and for the purpose specified.

2. In a furnace the combination with an outer casing comprising a plurality of sections, each section being hollow, means of communication between each of said sections, a water inlet and outlet communicating with said sections, a firebox located within said casing, brackets projecting within said casing above said firebox, a plurality of vertical casings supported upon said brackets, pipes for connecting said vertical casings in pairs and retaining the same in spaced relation, said pipes communicating with each pair of said casings, a plurality of tubes extending through said casings and said pipes, a supply pipe, branch pipes connecting the lower ends of one set of said casings with said supply pipe and the upper ends of the other set of said casings being connected to an outlet pipe, substantially as and for the purpose specified.

No. 181,531.

Clarence G. Plumb, Lorain, Ohio, U.S.A., 8th January, 1918; 6 years. Filed 27th August, 1917. Receipt No. 283,766.

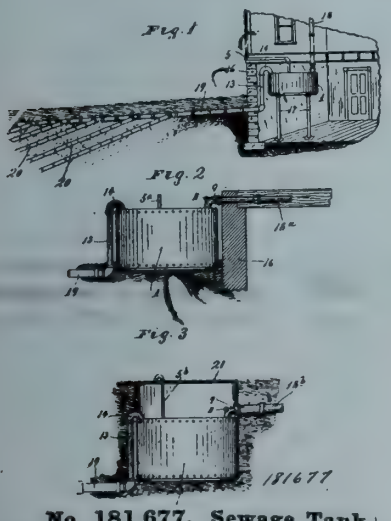
Claim.—1. A reservoir valve compris-

ing a hollow coupling having a bridge extending therethrough, and having its upper end portion cut to provide a valve seat, a guiding rod carried by said bridge and extending above the chamber, a cup carried by said guiding rod and provided with outlet openings adjacent its lower end, a tube slidably mounted upon said rod and extending above the lower end of said cup, a float connected with the lower portion of the tube and positioned about the same end having its lower portion forming a valve seated upon the valve seat of said coupler when the tube moves downwardly means for engaging the tube to move the same upwardly, and means for limiting the upward movement of the tube.

2. A reservoir tank valve comprising a coupler constituting a valve seat, a guiding rod extending above said coupler, a valve comprising a tubular body slidably mounted upon said guide rod, a float positioned about the lower portion of said body, and having its lower portion forming a valve head for seating upon the valve seat of said coupler said guiding rod being provided at its upper end with a cup extending above the upper end of said tube and limiting the upward movement of the tube, and means for drawing said tubular body upwardly.

3. A reservoir valve comprising a coupling constituting a valve seat, a valve comprising a tubular body, a float carried by said tubular body and provided with a valve head for seating upon the valve of said coupler, guiding means for the tubular body including a cup forming means for admitting fluid within the tubular body, and means for moving the tubular body upwardly to unseat the valve.

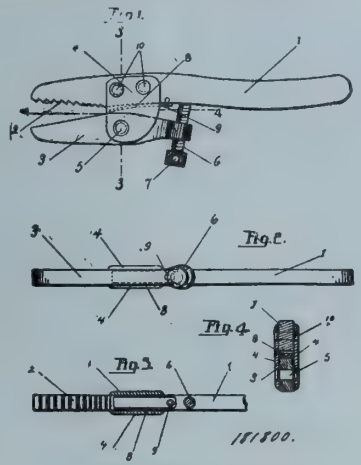
4. A reservoir valve comprising a hollow valve seat, a valve comprising a tubular body, a float carried by the body and provided with a valve head for seating upon the valve seat, and guiding means for the tubular body constituting



No. 181,677. Sewage Tank.

means for admitting fluid into the tubular body through the upper portion thereof.

5. A reservoir valve comprising a hollow coupling having a valve seat at its upper end, a guiding rod extending above the coupler, a cup carried by said guiding rod and provided with outlet openings adjacent its lower end, a tube slidably mounted upon said rod and extending above the lower end of said cup, a float connected with the lower portion of the tube and having a valve head at its lower end and seated upon the valve seat of said coupler when the tube moves downwardly, and means for engaging the tube to move the same upwardly.



No. 181,800. Wrench.

No. 181,677.

George C. Andrews, Minneapolis, Minnesota, U.S.A., 22nd January, 1918; 6 years. Filed 12th November, 1917. Receipt No. 287,474.

Claim.—1. A septic tank having a settling chamber and a siphon chamber connected at their upper portions by an overflow passage, and provided with rigid substantially closed tops, said settling chamber having an inlet conduit, and said siphon chamber having a discharge siphon arranged to intermittently discharge therefrom, the diameter of the inlet conduit being materially larger than the diameter of the siphon.

2. In a sewage system, a settling chamber and a siphon chamber connected at their upper portions by an overflow passage, and provided with substantially closed tops approximately on the same level, said settling chamber having an inlet conduit, and said siphon chamber having a discharge siphon, the crown of which extends above the tops of the said two chambers, the diameter of said inlet conduit being materially larger than the diameter of said siphon, substantially as described.

3. A septic tank having a partition with an overflow passage, said partition dividing said tank into a settling chamber and into a siphon chamber, a sewage pipe delivering into said settling chamber, a siphon leading from said siphon chamber, and a barrier plate extending downward from the top of said tank into said settling chamber and having its ends extending loosely against said partition, substantially as described.

No. 181,800.

Arthur S. E. Metcalfe, Driscoll, North Dakota, U.S.A., 15th January, 1918; 6 years. Filed 19th November, 1917. Receipt No. 287,798.

Claim.—1. A wrench, including a handle, a side plate rigidly connected to the handle, and a jaw rigidly connected to the side plate, a jaw mounted on the side plate to confront the fixed jaw, and a handle having rocking engagement with the lower end of the last-named jaw, said handle being bodily shiftable with relation to the side plate and engageable for pivotal movement with the side plate at a plurality of points.

2. A wrench, including handle, a side side plate rigidly connected to the handle, a jaw rigidly connected to the side plate, a movable jaw slidingly mounted on the side plate and having teeth at its inner end, a movable handle having teeth at its inner end and engaging teeth on the movable jaw, and a rack on the side plate, the last-named handle having a rocker thereon formed with a seat for the rack teeth, the handle being movable to disengage the seat from said rack teeth.

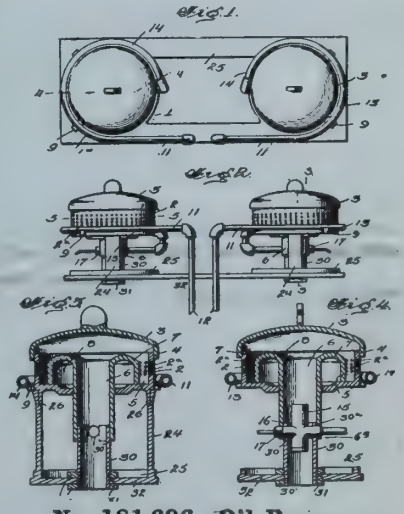
3. A wrench including a handle, a side plate rigidly connected to the handle, and a jaw rigidly connected to the side plate, a movable jaw slidingly mounted on the side plate and having teeth at its inner end, a movable handle having teeth at its inner end engaging the teeth on the movable jaw, and a rack attached to the side plate and having a series of teeth extending parallel to the upper edge of the side plate, the movable handle at its end adjacent to the movable jaw being provided with a rocker having a curved face adapted to rock upon the upper edge of the rack teeth, and said curved face terminating at its lower end in teeth adapted to engage with the rack teeth.

No. 181,582.

No. 181,696.

Barnard S. Feiner, Springfield, Massachusetts, U.S.R., 22nd January, 1918; 6 years. Filed 6th November, 1917. Receipt No. 287,265.

Claim.—1. In a device of the character described, the combination of a burner



No. 181,696. Oil Burner.

having an inner mouthpiece with an inverted flaring flange, a perforated shell having a central aperture to which said mouthpiece is attached and forms a

(Continued on page 30.)

Market Conditions and Tendencies

Statements Regarding the Prices and Trend of Supplies.

THE MARKETS AT A GLANCE

THE situation in respect to sheets is undoubtedly tightening up, and in fact all iron and steel products ordered from the United States manufacturers are subjected to very close scrutiny before acceptance of business is forthcoming. The position of sheets is emphasized by an advance which has been made locally of 50c per 100 pounds in galvanized, and the market is very firm at new prices.

Inability of manufacturers to secure pig iron and skelp is becoming more pronounced, and this is affecting production of soil pipe and fittings and wrought iron pipe also. Stocks of these lines are being broken into and efforts to accumulate a little reserve have not been attended with any measure of success.

Ingot tin to arrive shows a little easier tendency, but spot offerings are still made at high figures of past couple of weeks. Licenses for the import of tin have been granted, and the future looks that much better, though the date of arrival and quantity to come is unknown.

The lead market is firm, with an advance of ½c being recorded. This has provided a decidedly strong tone to the manufactured lead products list, and higher prices for the metal will very likely result in an advance on the bends, traps, pipe, etc.

Revised prices on valves are expected almost any day. The brass will, it is thought advance about 10 per cent. and the iron about 20 per cent. Some difficulty in getting materials is noticeable with this line, too. Business generally shows improvement, according to reports from all sources.

TORONTO, June 12.—A decidedly firmer tendency is noticeable in practically all the markets since last issue. This is due largely to restrictions on importations of practically all steel and iron and difficulty in procuring pig iron and pig tin. An advance of 10 per cent. in brass valves and 20 per cent. in iron valves is under consideration and will likely become effective within the next few days. Business generally shows some improvement.

Range Boilers Hold in Firm Position

RANGE BOILERS.—The position of this line remains very firm though prices hold unchanged. Supplies of sheets are reported ample in some quarters while others report the situation becoming steadily worse. Stocks are equal to present demands on the majority of sizes.

	Standard	Extra Heavy
30-gallon range boilers....	$14.00	$17.00
35-gallon	17.00	20.50
40-gallon	20.50	24.00
52-gallon	28.00	32.00
66-gallon	37.00	42.00
82-gallon	45.00	50.00
100-gallon	62.00	70.00

Better Demand Exists for Enamelware

ENAMELWARE.—A better demand is in evidence for these lines and improvement is expected to be manifest during the next few months, while building operations are at their height. The market holds very firm with prices unchanged at figures shown herewith.

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Sinks, roll rim, 18 x 30 in., staple.....	16 80
Closets, oak tank and seat	22 00
Do., enamel iron or white vitro tank...	23 75

Soil Pipe and Fittings Tightening Up

SOIL PIPE, FITTINGS.—The market on soil pipe and fittings is tightening up considerably and supplies are by no means heavy. It is practically impossible to secure supplies of pig iron and whereas quotations are held nominally at figures below, indications are that these may be withdrawn shortly. Cast iron and malleable pipe fittings have held unchanged, discounts being given below.

SOIL PIPE FITTINGS.

Medium and extra heavy soil pipe, 6-inch and under	35%	2½%
8-inch soil pipe	....	30%
Medium and extra heavy fittings, and under	40%	2½%

C. I. PIPE FITTINGS.

Cast iron fittings	....	10%
Cast elbows, tees, etc.....	....	10%
Plugs	....	20%
Bushings	....	20%
Flange unions, standard	....	10%
Dart unions, ¼-inch to 2-inch.....	20%	25%
Do., 4½ in. and larger	....	15%
Nipples, up to 4-inch	....	45%
Do., 4½-inch and larger	....	40%
Do., running thread 4-in. and under	....	25%
Couplings, 4-in. and under	....	35%
Do., 4½ in. and larger	....	15%

MALLEABLE FITTINGS

Malleable Fittgs., Class A, lb. net....	0 55-0 56	0 66-0 70
Do., Class B., lb. net....	0 24-0 25	0 34-0 35
Do., Class C., lb. net....	0 16-0 17	0 24-0 25

Position of Waste and Oakum Same

WASTE, OAKUM.—There are no new developments in the position of either waste or oakum from all accounts. A very good volume of orders for waste is going forward and prices are unchanged. Oakum is not moving quite so freely. Quotations on oakum are holding at figures shown below.

	Per 100 lbs.
Best American	$21 50
Clipper, spun	21 00
Do., unspun	19 50
Plumbers', spun	10 00

Substantial Increase in Valves Expected

VALVES.—A 10 per cent. advance in brass valves and a 20 per cent. increase in iron valves is under consideration and will become effective within the next few days, it is expected. Business continues in good volume and orders are going forward freely. Some difficulty in getting through supplies of raw materials continues to be manifest, but so far demands on stock are being very well taken care of.

	Discount off list
Ground work	50
Compression work, standard	52
High grade	45
Cushion work	46
Fuller work, standard	50
High grade	43
Basin cocks, No. 0 standard	46
Nos. 1 and 2	46
Bath cocks	53
Flatway stop and waste cocks, standard.	53
High grade	50

Roundway stop and waste cocks, standard	53
High grade	50
Brass steam cocks, standard	Net
Globe, angle and check valves, standard.	10
Do., removable seat	7½
Radiator valves, standard	15
Do., removable seat	10
Patent quick opening valves	35
Basin Cocks—	
No. 0 and 1, Fuller pattern	50

Wrot. Iron Pipe Firmer; Supply Getting Light

WROUGHT IRON PIPE.—The position of wrought iron pipe shows little change since last issue, prices holding firm and unchanged with the question of supplies increasingly difficult. Whereas present demands are being taken care of fairly well, supplies of raw materials are not coming through and if this condition continues, the situation as regards stocks can be easily determined. That higher levels may be reached in the matter of price is considered within the realm of possibility. Present quotations appear in panel on this page.

WROUGHT IRON PIPE

Effective Feb. 26, 1918

Standard Buttweld—	Per 100 feet Black	Galvanized
⅛ in.	$ 6 00	$ 8 00
¼ in.	5 16	7 29
⅜ in.	5 16	7 29
½ in.	6 55	8 12
¾ in.	8 28	10 41
1 in.	12 24	15 39
1¼ in.	16 56	20 82
1½ in.	19 80	24 89
2 in.	26 64	33 49
2½ in.	42 71	53 53
3 in.	55 85	70 00
3½ in.	70 84	87 76
4 in.	83 93	104 10
Standard Lapweld—		
2 in.	29 60	36 08
2½ in.	44 46	54 70
3 in.	58 14	71 53
3½ in.	72 68	90 62
4 in.	86 11	107 37
4½ in.	97 79	122 56
5 in.	114 00	142 82
6 in.	147 80	185 28
7 in.	192 80	241 57
8 L in.	202 50	253 75
8 in.	233 30	292 32
9 in.	279 50	350 18
10 L in.	259 20	324 80
10 in.	333 70	418 18

Terms 2% 30 days, approved credit.
Prices—Ontario, Quebec and Maritime Provinces.

Stocks Boiler Tubes Light; Situation Acute

BOILER TUBES.—The situation in boiler tubes is termed acute. Very limited supplies are getting through and the outlook for an improvement in this respect is not encouraging. Warehouses are practically bare of 2-inch, it is intimated, and there are many instances it is said where tubes are required to make necessary repairs but supplies are not forthcoming. Prices are holding at figures herewith:

Toronto—	Per 100 feet Cold drawn	Lapweld
1 inch	$36 00	$ ....
1¼ inch	40 00	....
1½ inch	43 00	36 00
1¾ inch	43 00	36 00
2 inch	50 00	36 00
2¼ inch	53 00	38 50
2½ inch	55 00	42 00
3 inch	64 00	50 00
3¼ inch	....	58 00
3½ inch	77 00	60 00
4 inch	90 00	75 00

Plate Advances $1.00; Demand for Sheets Good

SHEETS, PLATES.—Plates and 10 and 12-gauge black sheets have undergone revision upward during the week, the advance on plates amounting to $1.00 per 100 pounds and on sheets 50c per 100 pounds. Some supplies have been coming through but little more for warehousing purposes is expected. Shipments of galvanized and black sheets have been coming along in quite liberal quantities which would indicate that existing contracts are being taken care of. Stocks on hand locally are considered very good and the demand quite satisfactory. Prevailing quotations follow:

	Per 100 lbs.		
BLACK SHEETS—			
10 gauge	$....	$10 00	$12 00
12 gauge	7 15	10 10	10 00
14 gauge	7 20	8 15	8 40
16 gauge	7 25	8 25	8 50
18-20 gauge	7 30	7 80	8 05
22-24 gauge	7 35	7 85	8 10
26 gauge	7 40	7 90	8 15
28 gauge	7 50	8 00	8 25
3-16.inch plate	....	10 10	10 25
¼-inch boiler plate	....	....	10 00
GALVANIZED SHEETS—			
10¾ oz.	$9 00	$9 25	$9 50
U.S. 28	8 70	8 95	9 20
U.S. 26	8 40	8 65	8 90
22 and 24	8 25	8 50	8 75
18 and 20	8 10	8 35	8 60
16	7 95	8 20	8 45
14	7 85	8 10	8 35

No Change in Solder or Lead Products

LEAD AND ZINC PRODUCTS.—There has been no further revision made in prices on solder since last issue. Supplies in some quarters are considered ample for present requirements. The tin market remains unchanged with supplies becoming increasingly scarce and any sales made being at high levels.

The lead market shows increased strength, but this has not been reflected in any advance on the manufactured article, for which the demand shows some slight improvement. Quotations on all above products follow:

Lead pipe, lb.	$0 14	$....
Lead waste pipe, lb.	0 15	....
Lead traps and bends	Net list.	
Lead wool, lb.	0 16	
Lead sheets, 3 to 3½ lbs. sq. ft., lb.	0 13¼	
Lead sheets, 4 to 8 lbs. sq. ft.	0 12½	
Cut sheets, ¾c lb. extra, and cut sheets to size, 1c. lb. extra.		
Solder, guaranteed, lb.	0 66	0 70
Solder, strictly, lb.	0 60	0 66½
Solder, commercial, lb.	0 55	0 62
Solder, wiping, lb.	0 54½	0 56
Solder, wire, lb.	0 65	0 70

No New Developments in Old Materials

OLD MATERIALS.—New developments are still awaited in these markets and the time when these may be expected seems as far away now as it did some weeks ago. There is very little trading going on just now, but prices have been firmly held at unchanged figures. Business generally is at a standstill.

Tea lead	$0 04½	$....
Heavy lead pipe	0 07	0 07½
Yellow brass	0 12	0 13
Red brass	....	0 21
Light brass	....	0 09½
Heavy zinc	0 05½	0 06
Heavy copper	0 21½	0 22
Stove plate, per ton	17 00	18 00
Old cast iron, per ton	25 00	26 00
Zinc sheets, per lb.	0 26	....

Tin Strong With Weaker Tendency; Lead Up

INGOT METALS.—Tin is undoubtedly very strong, but the declines at primary points provide for an easier undertone; supplies are becoming increasingly scarce. A somewhat firmer tone has developed in respect to lead and price is up ¼c though little improvement in the demand is to be noted. Copper is unchanged, a good demand on producers being made but almost entirely for Government work.

COPPER.—No particular item of interest has marked this market. From producing centres come advices of a very good demand but further investigation reveals this to be on Government account direct or indirect, commercial transactions being small. Price locally is unchanged at 29-30c per pound.

TIN.—Nominally quotations are said to range about $1.07-$1.10, but no sales are being effected on this basis. Tin is not being offered at less than $1.25 and quotations run up from there. This metal grows increasingly scarce, arrivals being practically nil. Primary points show decided declines with little apparent buyer interest.

SPELTER.—The situation is unchanged, prices locally holding firm around 9c per pound and very little movement reported. Reports from the United States intimate that buying on Government account has been quite liberal, but figures are not divulged.

LEAD.—An advance of ¼c. bringing prices locally to 9½-9¾c per pound has featured this market since last issue. The demand for commercial uses is very light, with supplies apparently ample for other requirements. Primary points quote this metal firm.

ALUMINUM.—In the United States a new base price of 33c per pound f.o.b. producing points for 50 tons and over for ingots of 98 to 99 per cent. has been established by the War Industries Board, effective June 1. This has not influenced the local market which holds around 50c.

ANTIMONY.—Quiet reigns supreme locally, quotations remaining unchanged around 16c per pound with a light demand in evidence.

PIG IRON.—In spite of high prices the demand continues heavy and supplies are by no means equal to calls being made. Some difficulty supplying shops working on war orders is being experienced and scrap material which might relieve the situation to some extent is not forthcoming in quantities sufficient to help very much.

Chicoutimi Parish, Que.—Pierre Laberge has the general contract for $50,000 waterworks system for the town council. Ninety-five thousand feet of wooden pipe, 8, 6 and 4 inches in diameter, is required.

The Prime Enemy in Business

Progressive Methods in Business Prevented Through Fear—The Employee Fears to do a Big Day's Work and the Employer Fears to Pay Bigger Salaries

WHAT would you give to have all sense of fear destroyed in your consciousness—fear of the future, fear of disaster, fear of poverty, fear of some person, fear of an evil circumstance, fear of germs, fear of accident, and a thousand nameless fears that constantly harass the average human? asks a writer in a contemporary.

Fear is without question the "prime enemy" in business, and is likewise the greatest enemy in human happiness, progress and success.

The average person gets up in the morning, and, first of all, is afraid of certain things to eat; if the weather is wet, he is afraid of catching cold. He goes down town and is continually on the jump for fear of being hit by an automobile.

Perhaps he has recently taken a new position, and he is constantly afraid that his job is not giving satisfaction and that he cannot "hold his job"; or he is afraid that some fellow employee is going to "knock" him with the boss. He is afraid that he is not going to get that rise in salary, or, if times are a little dull, he is afraid that he may be let out. Sometimes, too, he may be afraid that he is going to do just a little more work than he is paid to do, or that he may be asked to work a little overtime or help some fellow worker once in a while. In fact, the whole round of the average day for the average person is made up of **fears**, either conscious, or sub-conscious.

Did it ever occur to you that this monster called **Fear** might be overcome if we only had the courage to face it for what it really is and put it out of our consciousness?

What is fear? Did you ever stop to analyze it? Did you ever make any effort to find out its true nature; where it comes from, and whether it is the master of you or you the master of it? Or have you thoughtlessly bowed to its mandates without questioning its authority?

It is self-evident, of course, that fear is a state of consciousness. Now, in order for fear to exercise any power or authority over you and make you miserable, mar your happiness, minimize your efficiency, and menace your success, it must first gain entrance into your consciousness. You say, "But how am I to keep the thought or sense of fear from coming into my consciousness?" You can answer this question by asking yourself another question. How can you keep darkness from coming into a room? By keeping the room filled with light, of course.

Just as you can keep darkness out of a room by keeping it filled with light, just so you can keep fear out of your consciousness by keeping your consciousness filled with thoughts that are the opposite of fear. If a man keeps his mind filled with thoughts of confidence and trust, thoughts of kindness for his fellow employees, unselfish consideration for the rights of others, with an earnest desire to do unto others as he would be done by, and places his faith in good instead of the seeming evil, that man has no room in his consciousness for thoughts of fear.

If a man is honestly striving to do by his employers as he would like to be done by when he gets to be an employer, it is impossible for that man to be afraid that he is not giving satisfaction. If he is entertaining thoughts of kindness for his fellow employees and unselfish consideration for others, he can never be afraid that he may do a little of somebody else's work or do a little more than he is paid to do.

There is an old saying that "the man who never does more than he is paid to do is never paid for more than he does." If a man is continually doing just a little more than he was hired to do, and is continually thinking of ways and means of making himself more valuable, how can he possibly be afraid that he is not going to get the rise in salary?—for he invariably gets it at the right time, and he knows all the time that he will get it if he replaces his thoughts of fear with thoughts of giving better service and a stronger desire to do as he would be done by if he were the boss.

The man whose consciousness is filled with thoughts of fear is identically like the room that is filled with darkness. Where does the darkness come from? Has it any real origin? Has it any substance? Did it come from any place or go to any place? When you fill a room with light what becomes of the darkness? Where does it go to? Darkness is nothing more nor less than a negative condition or the absence of something—the absence of light. Likewise, fear is simply a negative condition or the absence of unselfishness, kindness, consideration for others—absence of faith in the Creator of the universe as infinite good and faith in our fellow man.

In short, **fear** is a negative state of consciousness, or the absence of right thoughts; and as soon as we put right thoughts in the place of wrong thoughts we immediately see the unreality or the nothingness of the wrong thoughts which have caused all our fears.

It is perfectly plain that **fear** and **gratitude** do not travel on the same train—they cannot both occupy the same consciousness at the same time. Therefore why not cast out those ghostly shadows of the past and the fear of what might happen in the future? Let's go to our work each morning with minds so filled with gratitude for to-day's opportunities that there can be no room in our consciousness for a single thought of **fear.**

It matters not how small a job or how big a job we may have, let's be grateful that we have it—grateful for the opportunity that we have each day of doing our work just a little better than we did it the day before—grateful that we have the opportunity each day of being unselfish, kind and considerate toward everyone with whom we come in contact.

Discouragement, worry, anxiety, grouchiness and the accompanying discords are all by-products of **fear,** and such thoughts never make opportunities for us, and certainly never help us to improve them. But being grateful for, and making the best of to-day's opportunities is what makes to-morrow's opportunities grow.

We do not overcome all our wrong thoughts and all of our fears in one instant, but we do know that just in the degree that we keep our consciousness filled with light—with good thoughts—to that extent we make less room for thoughts that produce fear; and by this process of keeping our minds filled with thoughts of kindness, unselfishness, gratitude and loving service for others, we can all prove for ourselves that we do not have to remain in bondage to this relentless impostor called **fear.**

Therefore let's set our face to the task of destroying in our individual consciousness the prime enemy which is to-day doing more to defeat business success and human happiness than any other one thing.

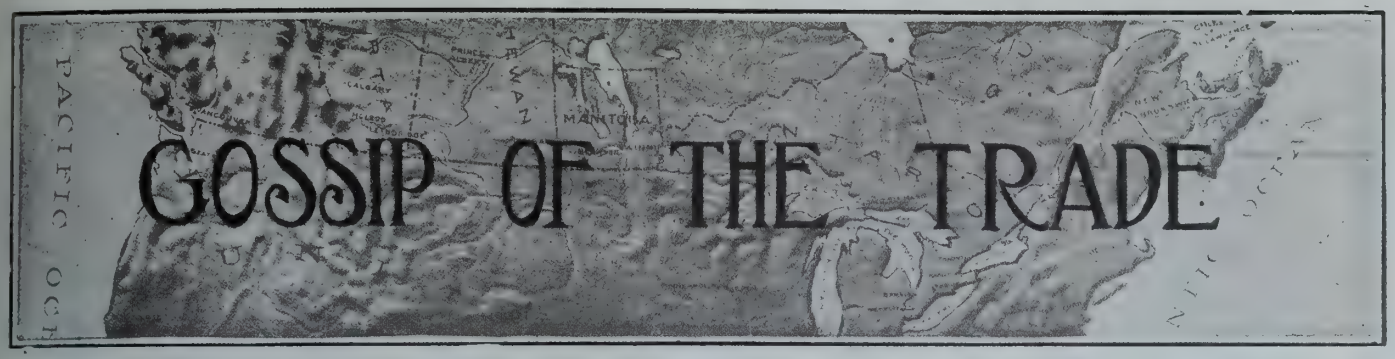
NEED OF PUBLIC COMFORT STATIONS

It is interesting to note that in almost every town or city in Canada the public are beginning to realize that public comfort stations are a necessity. St. Thomas citizens were reported recently as having broached the subject and now we see by the following that the inhabitants of a district in Toronto appear to be of the opinion that a comfort station should be built.

Need Lavatories

"The need for lavatories at the busy corners in the Danforth district is emphasized by residents. It is suggested that one be placed near the Broadview end of the viaduct, another at the eastern terminus of the civic car line, and one at Greenwood avenue."

York Township, Ont.—The water main service will be extended along Eglinton Avenue in the Fairbank section.



PITTING OF PIPE

Electrolysis, or pitting of pipes due to electricity running loose in the ground is not an unusual thing, although Toronto has been little troubled with it. A new phenomenon, however, has been discovered where a water service "went bad." It was discovered that a wire was lying across the water pipe outside the cellars, and that it had burned the whole top off the pipe for a distance of some feet.

GET SANITARY IMPROVEMENTS

Some years ago the Toronto City Health Department succeeded in getting legislation which enables citizens to instal sanitary conveniences at the city's cost, and pay for them in five yearly instalments (with interest). That is, they are placed on the same basis as a sidewalk or other local improvement. The yearly payments on these conveniences have reached $12.607.90 this year, as compared with $9,356.77 in 1917.

NEW VALVE COMPANY

Plant to Be Erected in Montreal by Crane Limited

A new company was organized to be known as Crane, Limited. The organization was effected on Tuesday and with the following officers: President, R. T. Crane, Jr.; First Vice-President, J. B. Berryman; Second Vice-President and Secretary, E. C. Townsend.

The intention of the Crane Co. is to erect a factory at once in Cote St. Paul on St. Patrick Street. This will be planned on the unit system so that additions may be made later as conditions warrant. The initial outlay calls for an expenditure of some $400.000, and when completed the company will be in a position to manufacture a complete line of valves and fittings. They also will make certain lines of plumbing and supplies and with the facilities of their new plant will be able to meet a considerable demand. This is to be the Canadian company of the Crane Co. of Chicago, one of the largest manufacturers and jobbers of sanitary engineering supplies in America.

RETURNS FROM THREE MONTHS' TRIP

E. T. Needham, representative of the Canadian Wolverine Co., Chatham, has returned home to Toronto from the West after a three months' tour. Mr. Needham visited all the chief towns and cities in the Western provinces and went as far as the coast of B. C. He reports that business is in a much healthier state, that sanitary and heating engineers are as a whole paying more attention to details affecting their financial affairs, and that back accounts are being paid up in such a way as to be very encouraging.

There is a shortage of houses in many cities and building operations appear to be a little more active than has been the case for some time back. Mr. Needham expressed his opinion that he did not think there would be any "Old time Western boom," but rather a steady improvement all round in all lines of trade. Such a state of affairs is most desirable, because of the fact that every boom has a very undesirable aftermath.

TORONTO SOCIETY EDUCATIONAL COMMITTEE DOINGS

The educational committee of the Toronto Society of Sanitary and Heating Engineers met June 13 in the society rooms and a number of advertising suggestions were submitted, these will appear in the July 1st issue of SANITARY ENGINEER. Copies, however, will be prepared and submitted to the members when they meet, at the next regular monthly meeting.

Some splendid information was procured and submitted to the committee by the chairman, Mr. Roy Belyea. It was shown that the cost of advertising or rather using space in the daily newspapers in an educational way would be very reasonable and within the means of the smallest concern doing business, providing of course that a fair number of the members would come in on the scheme.

The main idea behind the movement is to promote greater confidence and good will between the trade and the public, and it was shown in very vivid form that there is a need for a publicity campaign being conducted

One member submitted an account for $2.10 which had been given him as a proof that there was in Toronto at least "One honest plumber in the city" and the members present were unanimous in agreeing that the "plumber" who rendered such an account actually furnished material at less than invoice cost, the time charges being really less than laborers are getting.

The account proved that some plumbers need first of all a few lessons in bookkeeping. It further proved that an educational campaign would not only procure the good will of the public, but it would rouse the interest of the members of the trade to such an extent that their business would receive greater attention both from a mechanical and financial viewpoint.

CONTRACTS AWARDED

Halifax, N.S.—S. M. Brookfield, Ltd., has general contract for $30,000 hotel for the King Edward Hotel.

Gananoque, Ont.—Mitchell & Wilson have general contract for $6,640 school for the Board of Education.

Stanley, N.B.—M. W. Black has the general contract for church hall for the Church of England.

Edmonton, Alta.—E. M. Nesbitt Contracting Co., Ltd., has the general contract for $12,000 business block.

Montreal.—Darling Bros., Ltd., will let heating contract in connection with the erection of a $25,000 factory.

Winnipeg—Carter-Halls-Aldinger Co. have the general contract for $35,000 warehouse for the Imperial Oil Ltd.

Winnipeg.—Green & Lister, Ltd., have the ventilating and heating contracts for addition to school for the School Board.

Montreal.—W. J. McGuire & Co., Ltd., have plumbing contract in connection with the erection of a $25,000 factory for Darling Bros., Ltd.

Montreal.—John McGregor Ltd. has general contract in connection with alterations costing $15,000 to store for the Swift Canadian Co. Ltd. Plumbing contract will be let.

Ottawa.—H. Tapp has plumbing contract in connection with the erection of a $8,500 store and apartments for Lt.-Col. Gordon Stewart.

Pembroke, Ont.—A. F. Byers Co., Ltd., Montreal, have the general contract for $25,000 bank for the Merchants Bank of Canada.

Ottawa.—J. R. McLennan has plumbing and heating contracts in connection with the erection of a $25,000 store and offices for the H. H. Brennan Estate.

Saskatoon, Sask.—Smith Bros. & Wilson have the general contract in connection with the erection of a $100,000 hardware warehouse for the J. H. Ashdown Hardware Co. Ltd.

Moose Jaw, Sask.—Alexander & Baird have the plumbing and heating contracts in connection with the erection of a $35,000 store and office building for the Merchants' Bank of Canada.

Fort Qu'Appelle, Sask.—Cotter Bros., Ltd., Winnipeg, have plumbing and heating contracts for $206.000 tuberculosis sanitorium for the Saskatchewan Anti-Tuberculosis League.

McDermid & Kyle, Ltd., has been incorporated at Stratford, Ont., with a capital of $40,000 to carry on business as plumbers, steamfitters, etc.

CONSTRUCTION

Drumheller, Alta.—M. C. Switzer will erect a drug store and offices.

Edmonton, Alta.—James Ramsay Co. Ltd. will erect a $10,000 warehouse.

Ottawa.—St. Paul's Methodist Church contemplate the erection of a $65,000 church.

Alvinston, Ont.—Robert Wardell, Trenton, will rebuild flax mill at a cost of $10,000.

Bathurst, N.B.—Plans are being made for the construction of a bank for the Bank of Montreal.

Quebec.—The Military Hospitals Commission contemplate the erection of a military hospital.

Loiselleville, Ont.—H. J. Heintz Co., Leamington, contemplate the erection of a branch plant here.

London, Ont.—Loew's Theatre Syndicate, New York, contemplate the erection of a theatre here.

Sandwich East, Ont.—The Border Utilities Commission are preparing plans for the proposed drainage system.

Hamilton, Ont.—P. H. Secord & Sons have the general contract for a $50,000 warehouse for Imperial Oil Ltd.

Shawinigan Falls, Ont.—The Canadian Ferro Alloys Company contemplate the erection of a $100,000 factory.

Welland, Ont.—The council is contemplating sidewalk and sewer construction on several streets.

Petrolea, Ont.—Town council contemplate the construction of tile drainage work on Tank St.

Howick Township, Ont.—Council desire tenders for cement and supplies for making tile for drainage work.

New Liskeard, Ont.—The Ontario Department of Public Works contemplates the erection of an agricultural school here.

Sedgewick, Alta.—Tenders will be called for the erection of a $45,000 school for the Sedgewick Consolidated School Board.

St. Anne de Bellevue, Que.—Plans are being made for the construction of hospital buildings for the Military Hospitals Commission.

Leamington, Ont.—Henry Foster has the general contract for a $60.000 tobacco factory for the Imperial Tobacco Co. of Canada, Ltd.

Leamington, Ont.—F. Smithson has the general contract and George Slaney the contract for laying pipe for drainage system for the town.

Vancouver, B.C.—The board of works, city council, contemplate the construction of a sewer on Sixteenth Ave., from Sophia St. to St. George St.

Forestburg, Alta.—A consolidated school will be erected for the Forestburg, Grainland, Prairie and Ruff School districts at a cost of $18,000.

Montreal.—E. Martel will carry out plumbing and heating work in connection with the erection of a $13,000 church for the Roumanian Orthodox Church.

Trenton, Ont.—By-law has been passed to provide money for the purchase of the waterworks system of the town from the Hydro-Electric Commission of Ontario.

What is Your Opinion?

Blames Unventilated Sewers for Recent Epidemic of Grippe in Toronto—By Ventilating Sewers Dust Would Not be so Dangerously Germ-laden

A FEW weeks ago the City of Toronto, or rather its citizens, were all more or less suffering from severe attacks of "la grippe." All manner of men were asked their opinion—medical men, too—as to what they thought was the cause of this epidemic.

Dr. Hastings, in reply to an enquirer, said:

"As a matter of fact we have an epidemic almost every year. There are a number of cases, of course, just now, but we always seem to have an epidemic some time during the year. Few seem to have escaped this time. Everyone is doomed to get it some time or another. The majority of cases have been aggravated by the excessive amount of dust that is blowing. The Street Cleaning Department has not its full equipment, and the amount of dust in the streets at present is abnormal.

"When the dust gets down a person's throat then the trouble begins," continued Dr. Hastings. "The dust and the germs we carry, which like the poor are ever with us, together do the damage. The dust sets up irritation in the mucous membranes and a sore throat is the result."

Another medical man, Dr. Pepler, too, made a very similar statement. He blamed the dust, of course, and after describing how the "grippe" affected some of his patients, said:

"No doubt the weather has had a good deal to do with it. Since the break-up of the severe weather the winds have been doing their work. The snow kept the dust away, but the dust is flying round and playing havoc with people who are run down."

The writer was asked his opinion, and,

(Continued on page 30.)



The cartoonist like most of the public is ever on the alert to "take a rise" out of the plumber, but in this case, he tries to credit the plumber instead of the tinsmith. The idea behind this cartoon was, we believe based upon the fact that in a certain European paper tin millinery was suggested in case of air raids.



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

Will This Job Work?

Editor, Sanitary Engineer:—I would be very much obliged if you would give me your idea how to pipe the following job so as to get good hot water.

The 30-gallon range boiler is in the basement and is to be heated from the kitchen stove, which is situated on the floor above; there is also a stove in the basement but the stove is only used on washing days.

The boiler at present is hanging from the ceiling of the basement. Would it be better to have the boiler standing vertical on a stand as shown? I have not seen the job yet so do not know how it is piped, but they do not get hot water. Enclosed is a rough sketch of the way I think it should be piped, but I would like your opinion as you have helped me many a time before.

R. M. A. H.

Fig. 1 shows the sketch referred to, and under certain conditions it may work fairly well. The installing of a range boiler at a lower level than the heating appliance is very unusual, and should not be so installed if at all possible, but of course such an installation can be made to work fairly satisfactorily if certain rules are followed.

For example, in installing the loop shown in Fig. 1 the loop should be at least three times the length of the pipe from the lower pipe entering the bottom opening in the water front of the kitchen stove, see Fig. 2; so that it will be seen that the nearer the range boiler is to the opening referred to the better it is likely to work, simply because the top loop can be made longer. Turn to Fig. 1. We will suppose that the distance between the bottom pipe B at the water front in basement and the bottom pipe A entering the water front in the kitchen stove above is 8 feet, then it would be necessary to make the loop between top pipe at water front at C to D 24 feet long; this is a good rule to follow no matter in what position the boiler is placed.

Fig. 2, however, shows a method of piping which is preferable to the one shown in Fig. 1, and it will also be noted that the hot water supply is taken off

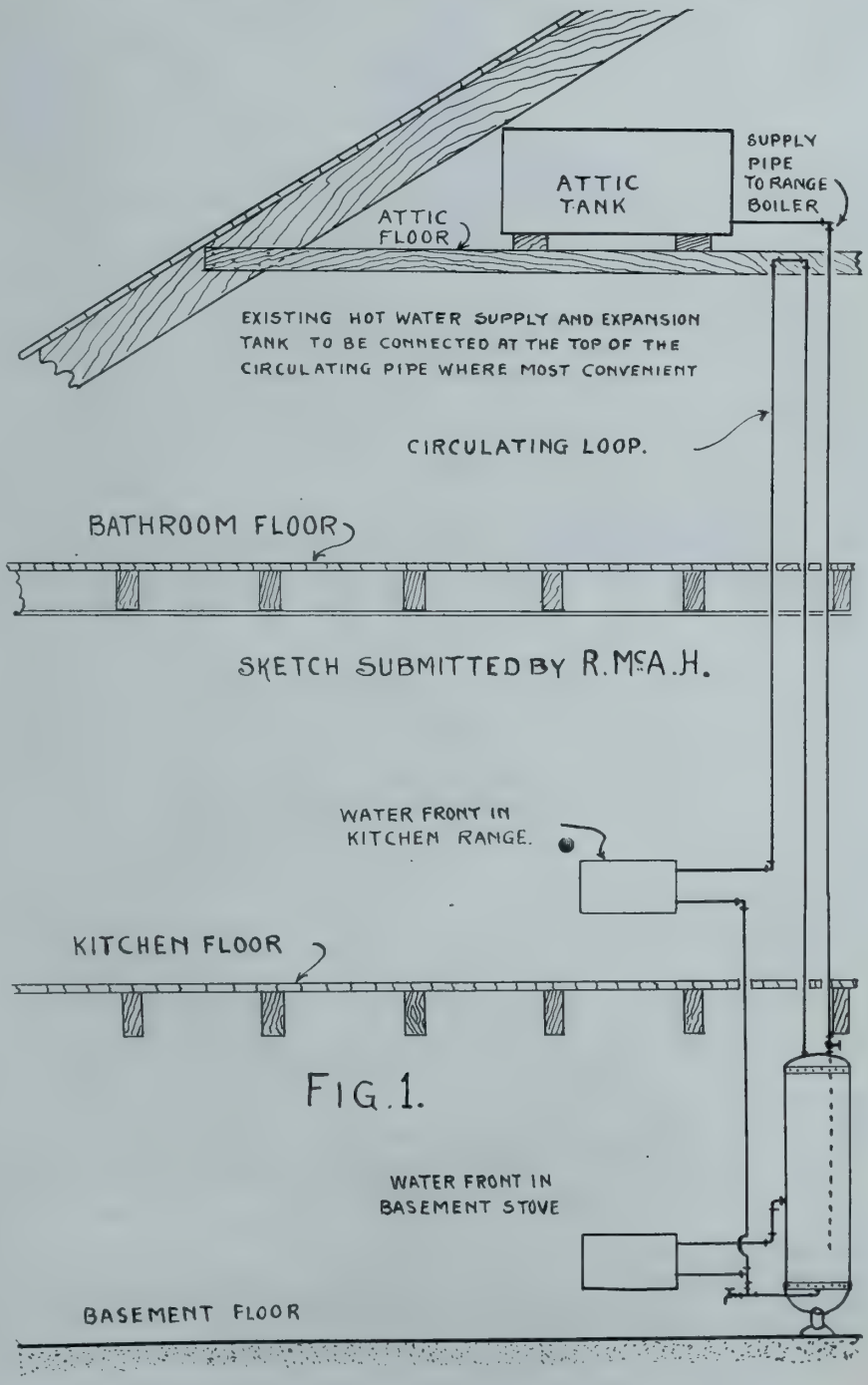


FIG. 1.

the pipe, leaving the top of the boiler, and there is no possible chance of the lower water front not heating the boiler, and the fact that it is higher than if in a vertical position makes it more desirable. Then again there is floor space saved, too; it is advisable to cover the boiler with asbestos so as to save all the heat possible. A good way to cover it, and cheap as well is to get a lot of newspapers wound round the boiler, covering these with a couple of thicknesses of asbestos paper and wiring same on with stove pipe wire. Regarding the note of sketch submitted, see Fig. 1, that "the existing hot water supply and expansion tank to be connected at the top of the circulating pipe where most convenient," we would say that it would be quite in order to take the hot water supply off this loop if there was only one water front to be used for heating and it was situated in the kitchen, with the boiler in the basement. But in this case there are two water fronts, and both are not always in use at the same time, so it would be advisable to take the supply off as shown in Fig. 2 and vent the loop with a size larger pipe, say 1 inch if the loop is ¾ inch, and we think those sizes should be used. This would mean that a ¾ x 1 inch bull-head tee should be used, or a ¾ x 1 x ¾ tee to take the place of one of the elbows, running the vent in a direct line with one of the sides of the loop. We would also advise that as few fittings be used as possible and that all pipes be reamed free of all burrs. Before concluding, however, it might not be out of place to say that if the loop shown in Fig. 1 is at least three times the height of the drop in the pipes below, following out the same principle there is every chance that it would work; this could be looked into before making the changes advised and shown in Fig. 2. In that case of course the hot water supply should be taken off near the boiler at the top, and a vent placed in top of loop as shown in Fig. 2.—Editor.

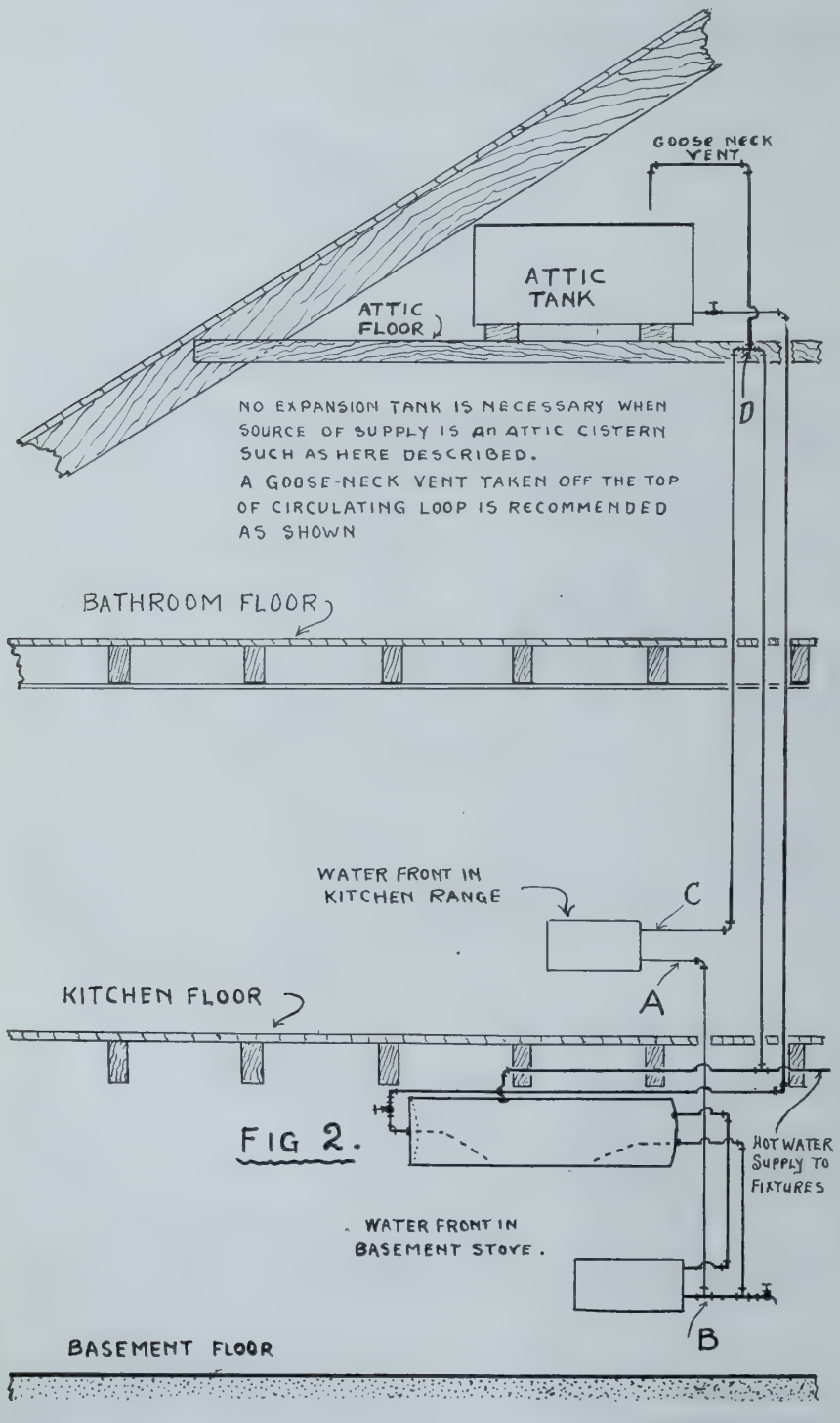


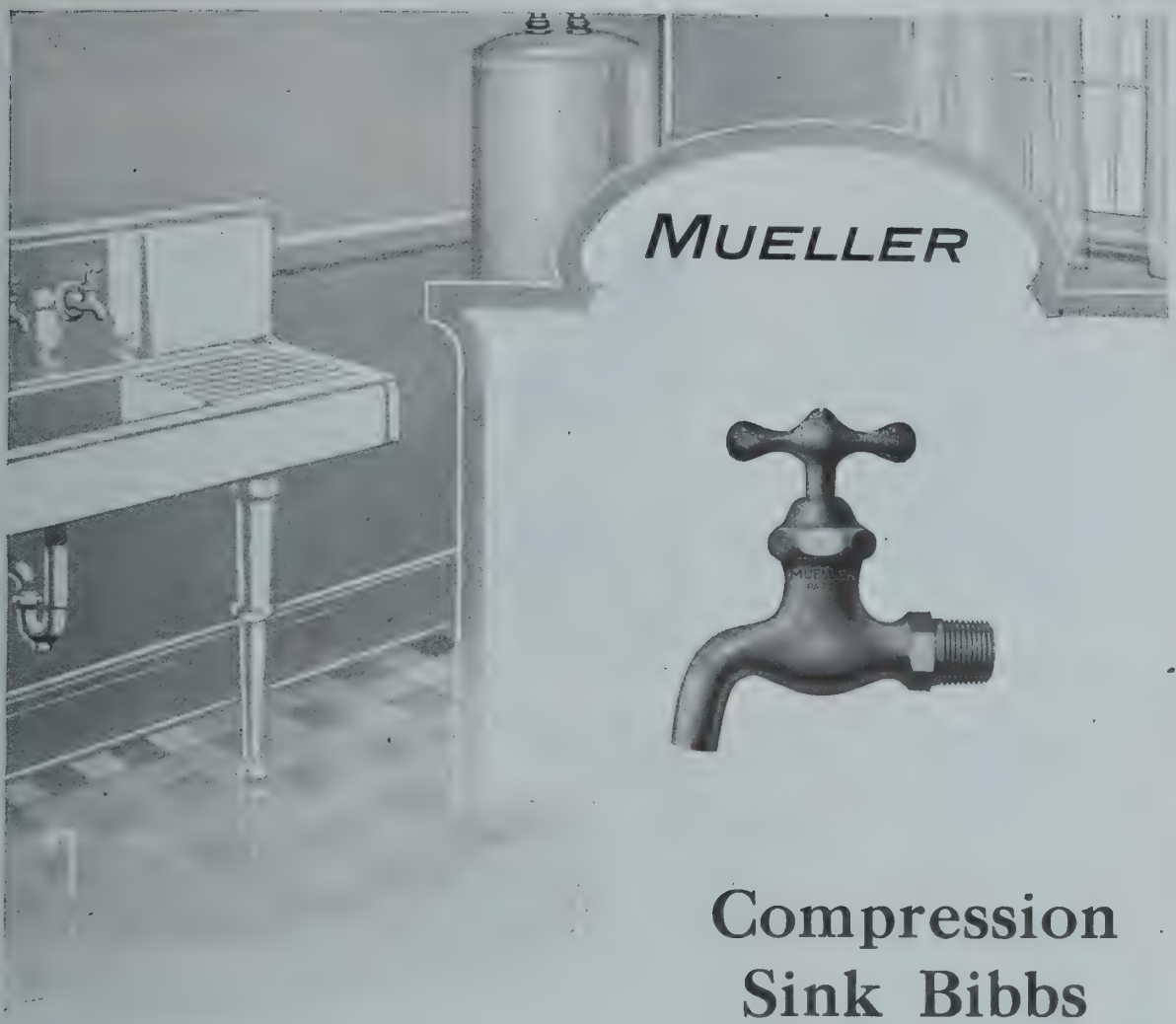
FIG 2.

WHAT A DELUSION

HON. F. B. CARVELL, Minister of Public Works at Ottawa, has sounded a note which will be re-echoed throughout Canada with approval when he announced a policy of stopping unnecessary expenditures and eliminating waste in the public finances. The political grafter has been the worst parasite on the body politic and any policy which will eliminate him and substitute efficiency engineering will be welcomed by a people who are disgusted with the evils of party government and seek the same honesty and capability in public affairs as is expected in the daily business activities of the nation.—*Mining Journal.*

Commenting upon the above, it is very easy for new brooms to "appear" to sweep clean. But there never was a broom yet that did not get worn out and in the wearing there never was a broom that was not responsible for creating a big pile of dirt, which if left alone will become putrified and decomposed. Hon. F. B. Carvell may be doing a lot of "sweeping" but he has a reckoning day coming. He is lacking the vital backbone necessary, because he insists upon ignoring the advice of practical men. He declares in effect that the laws of nature and science are not to be taken as evidence. He wilfully agreed to be swayed by impractical officeholders when he decided to be guided by the architects in charge of the work on the new parliament buildings. In the pipe alone which is being installed in that building, he was a party to wasting over $10,000. He is allowing thousands of dollars to be spent outside of Canada that could just as easily have been allowed to stay in Canada, and now the poor public are being "deluded"—that's all.

In connection with the controversy conducted in SANITARY ENGINEER as to the proper kind of pipe to use for soil waste and drainage purposes, Mr. Carvell's experts (?) gave a list of buildings in Canada that were equipped with wrought iron pipe for the purpose named. This list was given as evidence that wrought iron pipe was the best, etc. But one of the buildings in that list is having **all the wrought iron pipe taken out** and in the course of a few weeks we will publish the facts which will be accompanied by photographs. It will be



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interesting to the readers of SANITARY ENGINEER to learn that cast iron soil pipe and fittings are being installed in place of the wrought iron pipe at first installed. This is only the beginning, and if our readers are in the habit of recalling some of the things they read, they may bear in mind that in about 10 to 15 years the writer will possibly be reporting the fact that the wrought iron pipe "is being taken out of the Parliament Buildings, Ottawa, which were erected in the year 1917-18.

In the issue of Dec. 15, 1917, we published a list of buildings in which wrought iron pipe was installed and we stated "The above list should be of great value to every thinking sanitary engineer, having regard to the fact that extensive repairs will have to be undertaken in the near future," and we **know** there are others coming, because we **know** that the laws of nature cannot be taken lightly. Of course we also know that if wrought iron pipe or any other material is made from formulae that are in keeping with natural law, that corrosion under certain conditions will be no doubt overcome.

But we regret to know that men such as we have in Canada spending public money in millions will persist in ignoring practical science. They and their works must fail, and Mr. Carvell will be no exception to the rule unless he gets better men around him, men who are clean, practical engineers, men who really know and are not mere pretenders.

WHAT IS A VACUUM?

(Continued from page 16.)

of a vacuum can be conducted in this way. Take a pound coffee can; solder the lid on tight; punch a small pin hole in it, and tin all round the hole. Then get a small piece of sheet tin about the size of a dime; tin it, too; place about a tablespoonful of water in the tin, and put it over a flame, making steam escape through the small pin hole. Have a copper bit ready and the bit of tin, and as soon as steam is blowing out of the hole take the can from off the flame; sweat the bit of tin over the hole quickly and cool the can, which will then collapse.

NEW CANADIAN PATENTS

(Continued from page 21.)

benefit greatly, and a very simple experiment which will demonstrate the power closed annular space, a cap for the shell and forming therein a mixing chamber, a fixed nipple having an open lower end and upon which said mouthpiece is fitted, and a burner tip arranged to discharge into the mouthpiece and disposed in said nipple above the open lower end.

2. In a device of the character described, the combination of a burner having an inner mouthpiece with an inverted flaring flange, a perforated shell having a central aperture to which said mouthpiece is attached and forms a closed annular space, a cap for the shell and forming therein a mixing chamber, a fixed nipple upon which said mouthpiece is fitted, a burner tip arranged intermediately said mouthpiece and the nipple, and a support to which the nipple is adjustably attached.

3. In a device of the character described, a burner having a combustion chamber having a downwardly extending intake connection, an upwardly extending nipple telescoping in said connection,

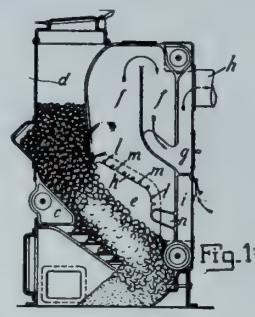
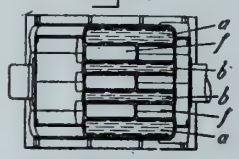


Fig.2.



No. 181,620.
Section for Boilers.

and a burner tip disposed between said connection and the nipple.

4. In a device of the character described, a burner having a combustion chamber having a downwardly extending intake connection which is notched at the end, an upwardly extending nipple telescoping in said connection, and a burner tip disposed between said connection and the nipple, the nipple having notches registrable with those of said connection, said tip embraced in said notches.

Ander Borch Reck, Hellerup, Denmark, 15th January, 1918; 6 years. Filed 15th September, 1916. Receipt No. 269,840.

Claim.—1. In a vertical section boiler, a section provided with an air channel giving access for air to the combustion chamber of the boiler, said channel being situated all along that part of the section which forms part of the top of the combustion chamber and which is in contact with the combustion products, before they pass into the smoke flues of the boiler, the part of the channel wall which is in contact with the combustion products being provided with openings for the passage of the air, the other part of the channel wall forming a partition between the channel and the water space of the section in a direction along the length of the channel.

2. In a vertical section boiler, a section provided with an air channel, giving access for air to the combustion chamber of the boiler, said channel being situated all along that part of the section which forms part of the top of the combustion chamber and which is in contact with the combustion products, before they pass into the smoke flues of the boiler, the part of the channel wall, which is in contact with the combustion products being provided with outlet openings for the passage of the air, the other part of the channel wall forming a partition between the channel and the water space of the boiler in a direction along the length of the channel, a suitable number of the said outlet openings for the passage of the air being narrow fissures in a direction across the length of the channel.

WHAT IS YOUR OPINION?

(Continued from page 26.)

of course, being a sanitary engineer, and knowing full well that clean dust is just as harmless as anything else, and that the construction of one's nasal organ will take care that nothing as large as dust will pass into one's system very easily, said that another solution to the problem must be arrived at.

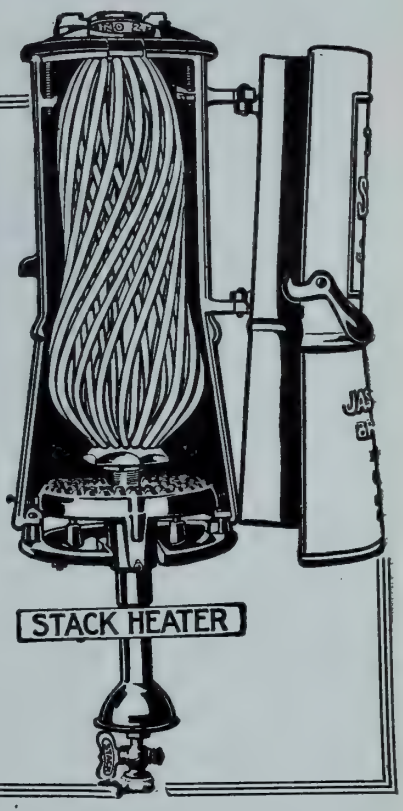
Most dust is insoluble—that is, it is of a mineral nature, but it can be contaminated, and thus become germ-laden. Both our medical friends say that the grippe is accounted for by the blowing about of germ-laden dust. But how do the germs get into the dust?

Here is the writer's opinion. In the City of Toronto the main house trap and breather is still demanded on all house drains; the sewers are not ventilated. As soon as the cold weather comes round the warm sewer air can be seen belching up through almost every manhole on every street. This germ-laden sewer air or gas falls to the ground, stays there all winter, because the snow absorbs it, as does the dust. We have very little wind until the spring, and then the snow is melted, leaving the germ-laden dust to dry. Then along comes the wind and blows the dust about. We breathe it; it enters our homes, and, until we have one or two severe rain storms the grippe reigns supreme. There was an exceptionally dry season this spring, and on account of there being a shortage of labor, no street cleaning, of course the dust got very dry and the citizens of Toronto got fed up on grippe via germ laden dust, the germs coming from unventilated sewers.

Now, what is the solution? Our medical men have not given us any idea, or not even suggested why the dust is germ-laden. The writer has shown how dust becomes germ-laden, and if the sewers were ventilated, if all house drains from the foot of the soil pipe stack to the sewer on the street were cast iron, and no main house trap allowed, every soil pipe terminal would act as a ventilator for our main sewers. There would be no sewer air or gas because there would be a constant circulation of fresh air always passing through the sewers.

So it will be seen that from a sanitary engineer's standpoint the main reason why Toronto citizens suffer more than almost any other city's people from "grippe" every year is because "the sewers are not ventilated, and these sewers could be if practical sanitary engineers were given a free hand, and main house traps and breathers were abolished.

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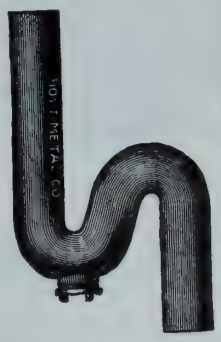
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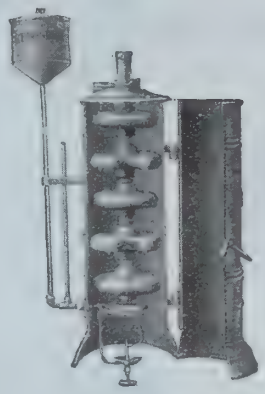
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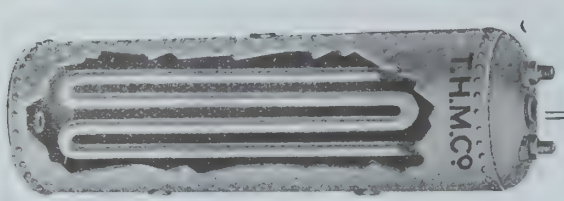
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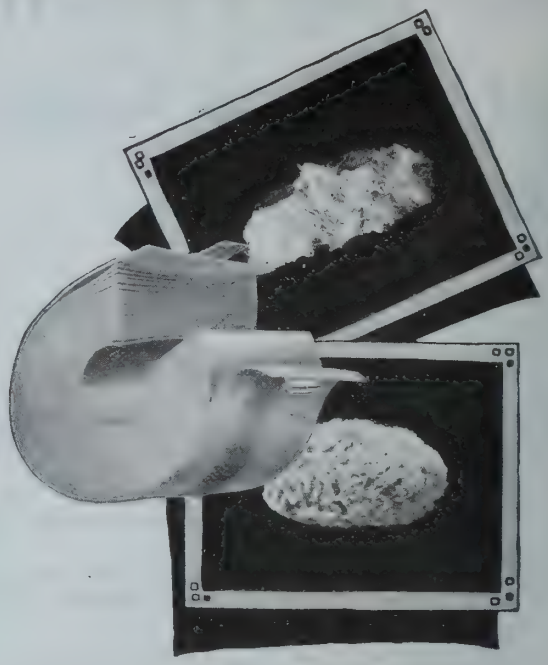
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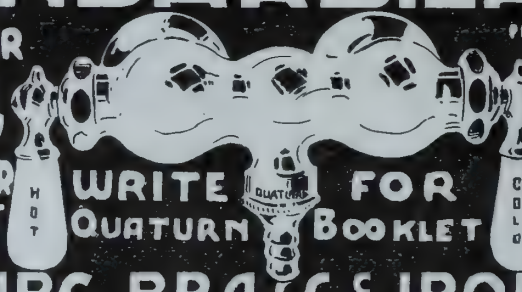
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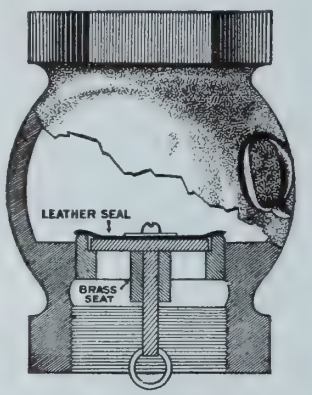


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High quality at the right price.

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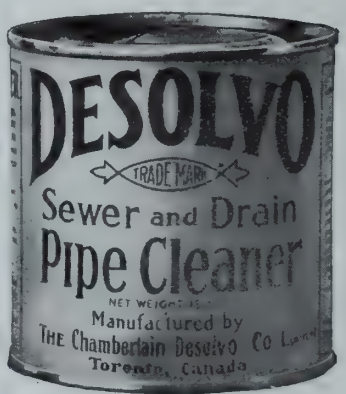
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Gets Hot with Cold Water Try it!

Users claim that DESOLVO is the most up-to-date, efficient and quickest in clearing choked drains, waste and soil pipes, etc.

We modestly claim that DESOLVO does all you expect it to do—and more.

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Write to-day on your letterhead for a can —at our expense.

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General Offices - - - - - PITTSBURGH, PA.

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Before installing any boiler system your prospect will be particularly anxious to know the fuel-saving argument of that boiler.

And you will have to convince him. But for you it will be easy, because—

The thin waterways of the "King" Boiler are particularly constructed for **quick heat** with the **minimum quantity of fuel;** the circulation is rapid and consequently the water in the radiators is easily kept warm.

This is one of numerous "King" features that make it so efficient and economical. The wide heatways and the deep firepot are other points to be brought out. Real heat facts that will impress and convince your customers!

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AYLMER HAND SYSTEMS, INCLUDING THE AYLMER 520 Pumps (The Standard of Canada) ARE GOOD SYSTEMS.

EASILY INSTALLED and **GIVE ABSOLUTE SATISFACTION.**

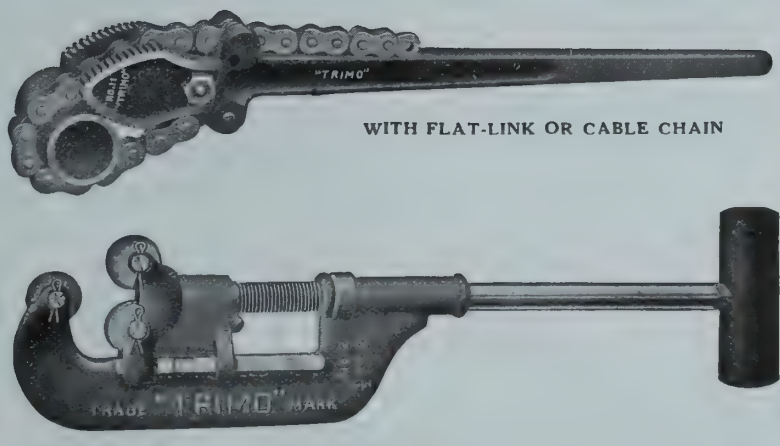
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TOOLS

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United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

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Canadian Wolverine Co., Ltd., Chatham.
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Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
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Wolff Plumbing

is the plumbing that makes for efficiency. It has been the standard of quality for over 60 years. It measures up to every requirement of the modern building. Write for catalogue.

L. Wolff Manufacturing Company

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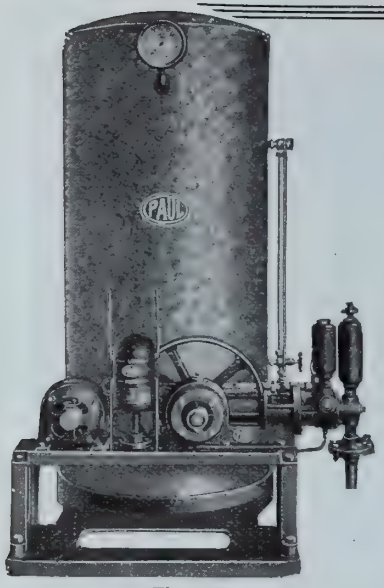


Fig. 886
Complete Unit Water System Type F Electric Motor Pump

CONFIDENCE

Your Pump trade depends on results. SALES—SATISFACTION—SERVICE—are the results—PROFIT the sequence. Have you the confidence to go to your prospective customers and tell them that you will supply a pump which eliminates trouble because it is self-priming—it is automatically lubricated—no packing to get out of order—gives the maximum of service with the minimum of attention?

You can do it with a "PAUL"

Hurley Paul Service Pumps,—creates confidence.

HURLEY MACHINE COMPANY, LIMITED

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WROUGHT PIPE

BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.
All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES Black and Galvanized All Sizes

Ask your jobber for CT Brand

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Montreal — Works: Lachine, Can.

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THE best possible buyer is not made an actual buyer at a single step It is one thing to win the buyer's favor for an article and another to make adjustments incident to closing the sale. Winning the buyer's favor is the work of trade paper advertising. Under ordinary conditions it should not be expected to do more.

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The

"DAISY"

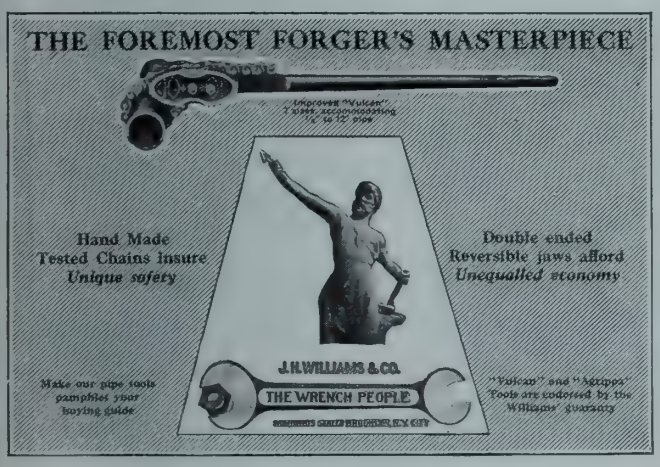
Hot Water Boiler

Over 50,000 in Use

SPEAKS FOR ITSELF!

WARDEN KING Limited, Montreal

BRANCH OFFICE : 200 ADELAIDE ST. W., TORONTO



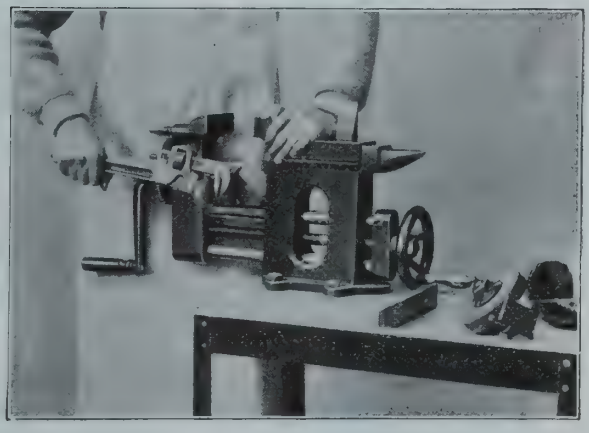
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THE

Stewart Handy Worker

An Equipment All in One



WEIGHS 90 POUNDS

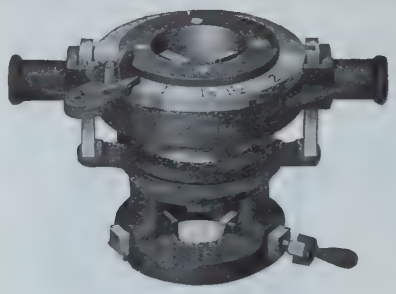
The Equipment Comprises——

A Pipe Vise
A Bench Vise
A Bench Grinder
A Two-Speed Drill
A Hardy Cutter
An Anvil

It's not a toy. It's a real combination of practical tools for practical people.

Write for full particulars.

CHICAGO FLEXIBLE SHAFT COMPANY
12th Street and Central Avenue
Department H.W. CHICAGO, U. S. A.



PIPE THREADING AND CUTTING TOOLS

One Man Can Thread up to 12 Inch.



Cuts Without Burring

No. 1 cuts from ⅛″ to 1″
No. 5 cuts from ½″ to 2″
No. 10 cuts from 2½″ to 4″
No. 15 cuts from 4″ to 6″

You cannot afford to expect your men to make horses of themselves. If they did they could not keep it up. Our tools save time, do better work and makes life worth living for your men.

Ratchet	Geared
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The Borden-Canadian Company
TORONTO, CANADA



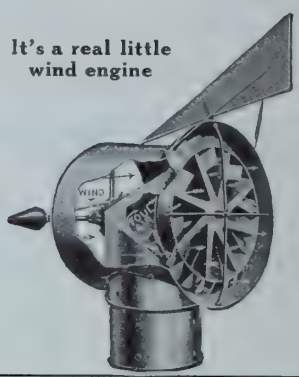
Rogers Malacca Cleaning Rods

for cleaning boiler tubes, chimney flues, soot chambers and underground fitings—saves excavating. Fitted with Scraper, Brush, Screw and Plunger.

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120 PRINCE STREET - - MONTREAL

THE BICALKY

It's a real little wind engine



VENTILATOR
Is a positive suction fan that ventilates

The "Bicalky" will dispense with all auxiliary heaters on local ventilation systems.

It is, as far as we know, the most scientifically constructed, self-propelled fan ventilator on the market.

Write us for full particulars.

BICALKY FAN CO.
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"HAUSE" PIPE JOINT CEMENT

For steam, water, air, oil, gas, gaskets, etc. The cement that cements. Sets like gum. Allows no leaks.

The Great Value of "HAUSE PIPE JOINT CEMENT" lies in its peculiar chemical properties which permits of its hardening and expanding after the joints are made up. In making up joints it has the same effect as a lubricant on the best graphite, and while the joints may be made and broken readily, a perfectly tight joint is maintained at all times. Comes in 1-lb., 5-lb., 15-lb., 25-lb., 50-lb. cans, 100-lb. barrels. Manufactured in ready mixed and powder form. Ask your jobber for prices, or write us direct.



Manufactured in Ready Mixed and Powder Form.

Made in Omaha, Neb., U.S.A., by

Chas. F. Hause Mfg. Co., Inc., Omaha, Neb.

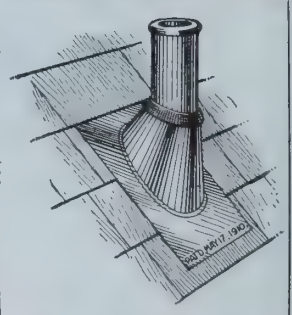
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Sanitary Engineer
143 University Avenue, Toronto

The SIMPLEX Adjustable Roof Flange

Fits any roof from ½ pitch to flat—just slide it down the pipe and it will conform with the pitch of the roof.



Trade Price 2″ $1.00 4″ $1.15

Made in all sizes—For sale by nearly every jobber

Simplex Mfg. Company - Chicago, Ill.
Canadian Representative W. H. CUNNINGHAM, 183 Church St. TORONTO, ONT.

"JUST ONE MINUTE"

To call your attention to the Famous B & C Floor and Ceiling Plates.
Our No. 15 style narrow flange designed for the Canadian trade.

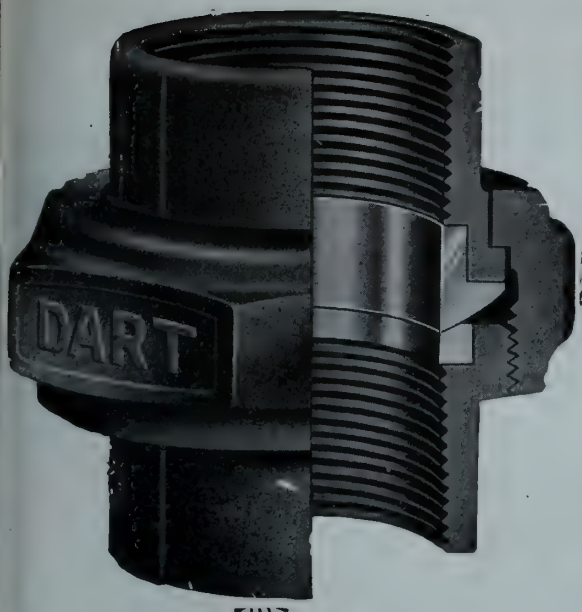
One of many styles



No. 15

Handsomely nickel-plated or plain Sizes ½ to 2″

Stock now carried by our Canadian Representative
W. H. CUNNINGHAM, 183 CHURCH ST., TORONTO, Canada
THE BEATON & CORBIN MFG. COMPANY
Southington, Conn., U.S.A.



"BRONZE TO BRONZE AT THE JOINT"

If Unions were sold according to length of service rendered, the first cost of Dart Unions would be **highest.**

Dart Unions cost less to buy.

They afford the purchaser a decided saving in money and time because of their easy connection, regardless of alignment—and length of service rendered.

There can be no rust or corrosion in a Dart Union, because the face and seat are of bronze. They won't loosen or leak.

If you have never used Dart Unions, try them on your next job and see if they don't mean insurance against pipe coupling troubles.

Ask your jobber for them.

Manufactured by

DART UNION CO., Limited

TORONTO, CANADA

There Are Lots of Gate Valves

Advertised and Sold



but not all of them possess that n e a t appearance, combined with strength and s t a b i l i t y, w h i c h characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.

Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.

Approved by the Fire Underwriters' Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario

Registered **PERFECTO** *Trade Mark*

The Test of a Bibb is—*Service*

Capture
Your
Customer's
Confidence

—His
Future
Business

Instal
Perfecto



GUARANTEE

Any article of our make proving defective through inferior metal, or improper workmanship, on our part, will be replaced with **TWO** good ones, at **NO CHARGE** to you. You can't beat it.

Send us your order now.

GALT BRASS COMPANY, LIMITED
GALT - CANADA

SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

Vol. XII. Publication Office, Toronto, July 1, 1918 No. 13

The Best the Market Affords



PLATE A21 D

With Oak and VitrO Closet Outfits in stock, you are placed in a position to give your customer the best that the market affords.

Empire Vitrous China Closet Combinations are durable, neat in appearance and silent in operation.

We can make prompt shipment of plumbing and heating materials.

EMPIRE MANUFACTURING CO., LIMITED

LONDON TORONTO

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While



A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for BEAVER BRAND CAST IRON ENAMEL WARE

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DOMINION
RUBBER SYSTEM
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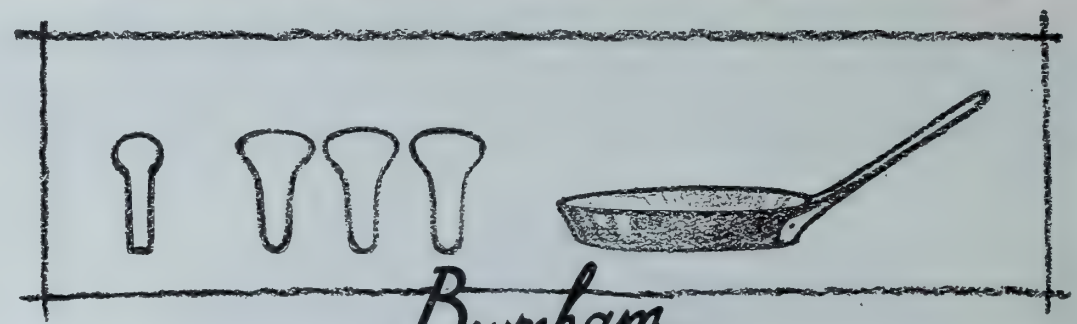
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A keyhole and a sauce pan—— their relation to coal economy

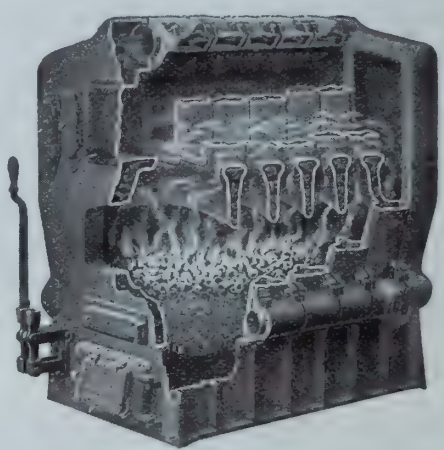
IT is altogether obvious that water in a shallow sauce pan, with a broad bottom, heats quicker than in a deep kettle with a narrow bottom.

Likewise, it is obvious that the quicker water heats, the quicker you get steam.

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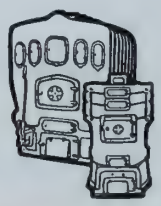
They are key-hole shaped.

The fire comes up against three sides of them.

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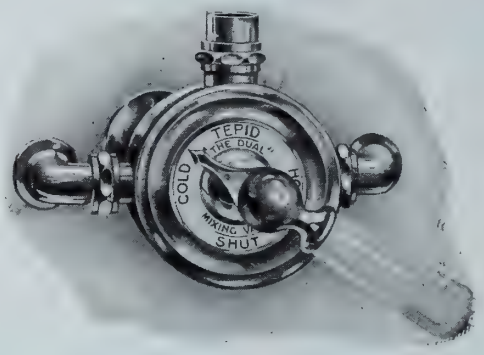
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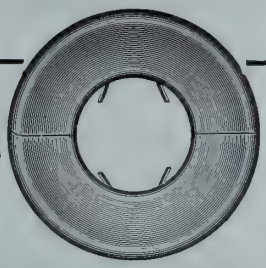
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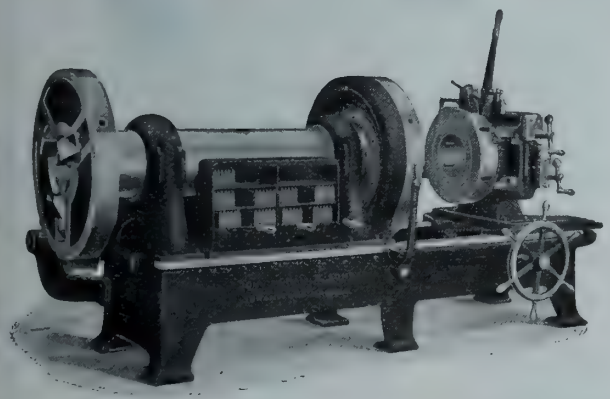
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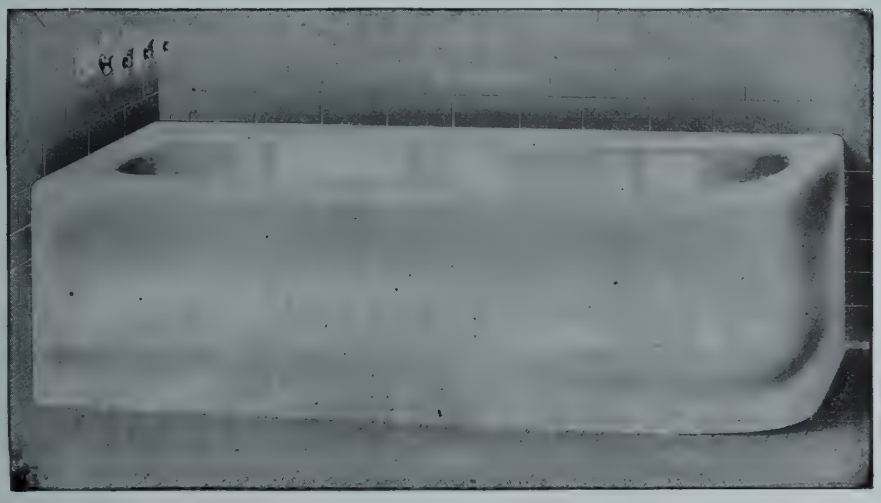
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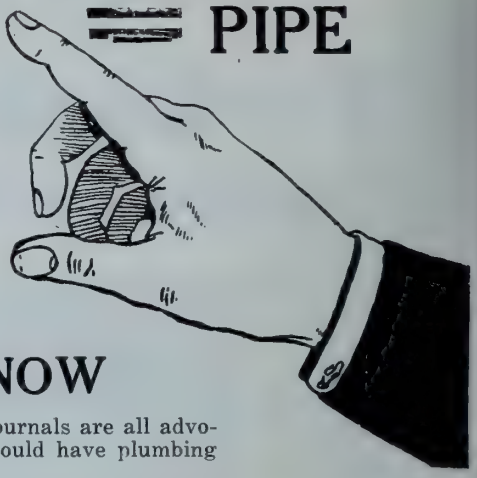
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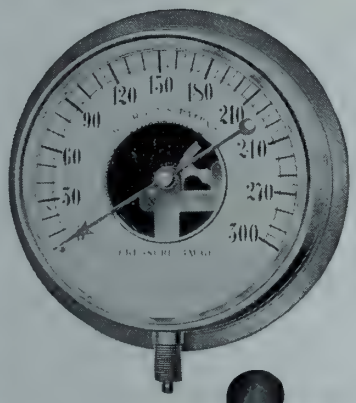
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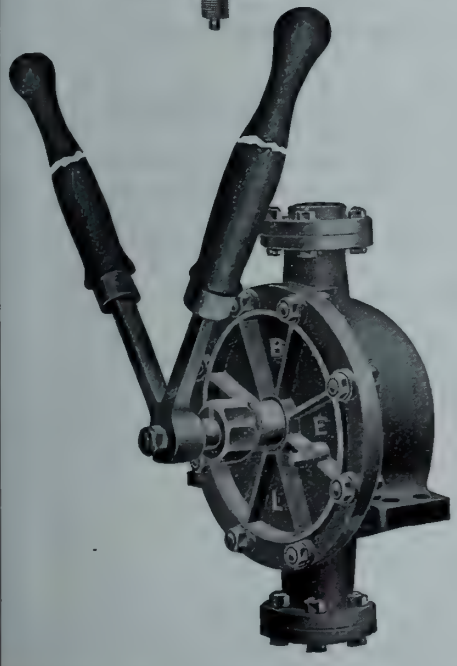
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SANITARY ENGINEER
PLUMBER AND STEAMFITTER OF CANADA

Vol. XII. TORONTO, JULY 1, 1918 No. 13

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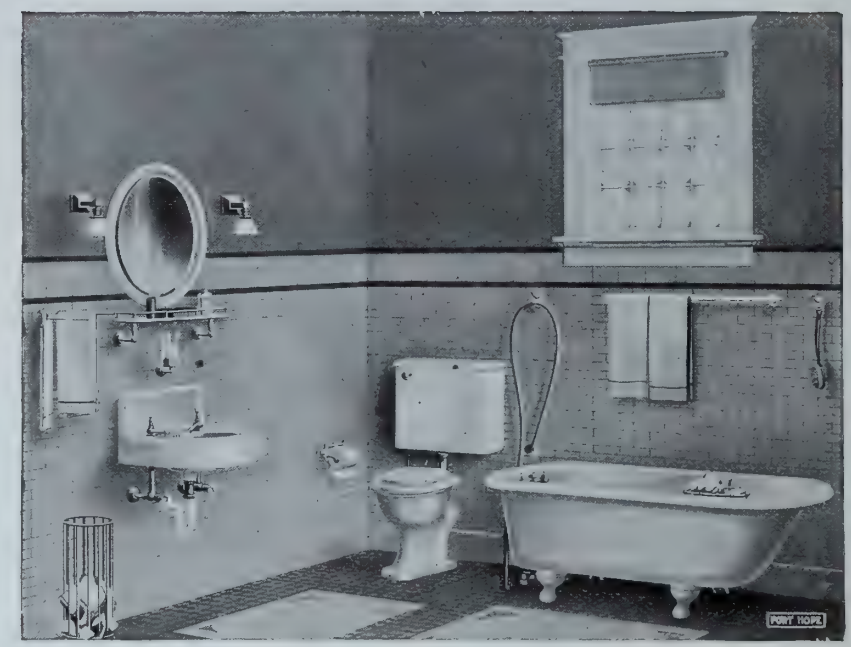
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SANITARY ENGINEER

VOL. XII JULY 1, 1918 No. 13

A Chat About Coal Saving

Coal Should and Can be Saved if Common Sense is Practised—Sanitary Engineers Will Find Some Splendid Common Sense Arguments in This Article—Simple, and Constructive, Forceful and Free From Highly Technical Phraseology

By J. F. L. Carron, Montreal

I READ with much interest the article in your issue of March 15 entitled, "How to Save Coal."

Other articles along the same general lines have appeared in other publications at different times during the past winter.

They have been inspired no doubt by the shortage of coal and the nigh price prevailing for this fuel, and as these conditions are likely to continue, at least for some time to come, perhaps you might consider an article going a little further into the subject of fuel waste or fuel saving would interest your readers.

The suggestions offered by Governor Whitman if carried out would undoubtedly effect a saving, that is, users of coal in their presently-constructed heating apparatus would secure the same degree of warmth and comfort with a somewhat less expenditure of fuel.

To my mind, however, the saving of fuel that can be effected in the already installed heating apparatus is only a fraction of what might be saved had the proper type of apparatus been selected and installed originally, having in view the size and style of building to be warmed and the requirements of each case.

Most of our dwellings and many of our schools, offices and other large buildings are warmed by hot water circulation, and for years it has been as a voice crying in the wilderness if anyone suggested anything else.

Personally I am convinced that for small dwelling houses and flats, heating by circulation of hot water can be done with a less expenditure for fuel than by any other method we know of at present, provided the heater selected is one designed to do what is expected of it, with the least quantity of fuel, and provided the rest of the apparatus is properly installed; that is, the proper amount of pipe or of cast iron radiators, with the water maintained at a given temperature, and further provided the connections between the heater and the radiators have been properly made.

I am not convinced though, and do not believe that large buildings, such as large dwelling houses, stores, schools, warehouses, convents, and buildings generally larger than small houses and flats, can be warmed by hot water circulation with less fuel than by any other method. On the contrary, I believe that if our large buildings that are now warmed in this way were warmed by circulating vapor the same result could be attained



WILLIAMS "VULCAN"

with a saving of from 15 per cent. to 25 per cent. of the fuel used.

Returning to the statement that I believe hot water best for ordinary houses, under certain conditions:

The first condition is, of course, the selection of the type and size of heater to meet the requirements. There are various types of heaters on the market and they will all heat water, anything that will hold water, and that a fire can be put under will heat it. How many know, or have ever tried to find out, what type will do it quickest and with least fuel? My experience has proved to me that the heater that has a central water circulation, that is one in which the water is heated, ascends directly up through the center of the heater and is always surrounded by the heated gases and products of combustion, will heat and circulate water quicker, and with less expenditure for fuel than any other type, and I understand that the Institute for Thermal Research at Buffalo has proved this to be the case.

Having decided on the type of heater to be installed, before it can be determined what size of this will be required, it is necessary to find out how much heating surface, either in iron pipe or cast iron radiators is required to heat the building, and every large house, and indeed every room in the house presents its own problem for solution. The construction of the building, the wall exposure, the glass surface, the prevailing winds, and various other conditions, all have a bearing on this and on their correct solution depends the result whether we get an apparatus that will do the work intended with the minimum amount of fuel.

The point I wish to make is this, that thousands of tons of coal are actually wasted, burned up, absolutely for nothing but a disregard to these essentials in the installation of the heating plant.

As a concrete example, I personally know of a building, a store on the ground floor and two flats above, in which there was installed some years ago a No. 6 hot water heater and 992 square feet of heating surface, designed to warm it and supposed to be a first-class heating system, and as a matter of fact the work was well done, but it never did heat the place properly, and this year, up to date, they have burned up thirty tons of hard coal, and the place has scarcely been warm enough to live in. The user of this apparatus, like most of us, knows nothing about heating problems except that he has a hot water heater in his cellar and naturally when the place gets cold shakes up the heater and puts in more coal, not knowing that it is doing all that can be expected of it for its size, and for the amount of radiation in the place, and that if he burned fifty tons of coal in the heater we would get no better results upstairs.

On this system being analysed it was found that on the ground floor alone there was nearly 100 square feet of radiation short of the necessary amount to warm it properly, and the other floors were in the same ratio. There should have been a 7½ heater and 1,270 square feet of radiation, and with this equip-

ment the building would have been comfortable, and he would probably have burned about twenty tons of coal. So we see that in this building alone ten tons of good hard coal worth about $100 has been absolutely wasted this winter, enough to keep, if properly used, one average home warm all winter.

My observations have led me to the conclusion that the limit of successful and economical heating by hot water circulation is reached in a round hot water heater, having a fire pot not more than three feet in diameter, or in a combination of units not larger than this, and that a round hot water heater, having a fire pot four or five feet in diameter that a cart load of coal can be backed up to and dumped into before a fire can even be started is extremely wasteful on fuel. Users of this style of apparatus will know whether to agree with me or not.

I have tried to show how the proper selection and installation of the heating system in small buildings would save large quantities of fuel, and now let us examine my other statement, that although all right for small buildings, it is not the best for large ones, and the bearing of this statement on the same question.

Take schools for instance, they do not require very much heat from 4 o'clock in the afternoon until 9 o'clock next morning, from Friday afternoon until Monday morning, or during holidays, and they do require ventilation, which, in this climate cannot be secured by hot water circulation. Likewise stores and warehouses require very little heat at night or from Saturday noon until Monday morning and on holidays.

If a heating system can be installed that can conform to these conditions, then we shall have a plant that will do what is required with the minimum amount of fuel, and save vast quantities of fuel that is now every night, every week end, and every holiday burned up uselessly—wasted.

Such a system can be secured by circulating vapor instead of hot water. Vapor heating is not new, but we do not seem to have been keeping up with the procession; we are a conservative people, and in the matter of heating anyway seem satisfied to go on using the same heaters and the same methods as we did twenty-five to thirty years ago in spite of the march of progress, for the science of heating has not stood still any more than has that of electricity or aviation, or for that matter any other science.

Vapor heating has been used for many years in European countries, and in recent years in the United States. It is steadily growing in favor and will continue to do so, because it is the best and cheapest method yet devised for warming a certain class of building. It is simple to instal, presenting no more complications than boiling water in a tea kettle on a stove, which is indeed just what it is, and the steam you see coming from the spout of the boiling tea kettle is the vapor that is circulated through the pipes and radiators to heat the building in much the same way as hot water is circulated.

A vapor system adjusts itself automatically to weather conditions; if the weather is mild, less vapor is generated and less fuel used. At times, when little heat or none is required only a small fire is necessary, and on week ends and holidays only that portion of the building where there is water likely to freeze need be heated. On Monday morning all the heat required can be generated and distributed all over a large building in half an hour, while with hot water it would be noon before the building would be comfortable.

This letter is not intended to be a treatise on vapor or any other system of heating. I have only been trying to show in as few words as possible how thousands of tons of coal are burned up for nothing, worse than wasted, in our present heating systems, and endeavor to point out how, in future buildings, mistakes of the past may be remedied.

Given the plans of any building, a competent heating engineer is able to figure a reasonably approximate estimate of the fuel required to heat it during an average winter, and also to design a system that will do it, but this cannot be done except by a fortunate accident by rule-of-thumb methods.

I am enclosing you a copy of an article entitled, "How Much Fuel Does Your Heater Burn?" This appeared in the "Ideal Heating Journal" some time ago, and while too technical to be followed by the average householder will show the trade how closely the matter of fuel consumption has been investigated by heating engineers.

It is to be hoped that the present high price and scarcity of coal will not be permanent, but if this condition has had the effect, as it would appear from the interest taken in the various articles that have appeared on the subject of compelling us to try and catch up with the procession in heating matters, it would surely result in the saving of very large quantities of coal.

HOW MUCH COAL DOES YOUR HEATER BURN?*

Fuel economy is of vital interst to the house-owner and consequently is an important consideration when attempts are made to present the value of modern heating methods.

One of the first questions asked is, "How much coal does your heater burn?"

To this question some answer must be made—but because of all the varying conditions which are liable to occur the answer is usually so surrounded by "ifs" that the owner becomes discouraged and an otherwise good prospect becomes doubtful.

To be asked to guarantee the amount of fuel which will be burned is of course unreasonable because of the varying conditions of installation—load, weather, etc., but it is possible to give an approximation based on average conditions taken over a long period of time.

The U. S. Weather Bureau publishes data available to anyone on application, and from this it is possible to get an idea of the average or normal temperature which has prevailed in different sections of the country, and knowing the conditions under which the heating installation has been guaranteed a proportion may be established for average conditions.

It will be readily admitted that if the conditions for which the heating installation has been figured were to maintain during the whole period (day and night—hour after hour—and minute by minute) of the heating season, a maximum amount of coal would be burned.

These maximum conditions do not, however, maintain, never have maintained, nor are ever likely to maintain. So that if we consider that the load to be established in estimating coal consumption is that required for the heating season under average temperature conditions we can approximate the actual consumption of fuel under proper conditions of installation and attention.

In arriving at a proportion it should be understood that the temperature of air surrounding the cooling or condensing surface is a constant (say 70°) and that the temperature of the water or steam leaving the boiler is a constant (180° for water, 219° for steam), under which conditions the coefficient for heat loss from cooling or condensing surface will be a constant (say 150° for water, 240° for steam) so the proportion of the maximum load will be that amount of radiation which would heat to 70° with temperature at the boiler as above compared with that amount necessary to heat to 70° with same temperature of heating medium under maximum or extreme conditions. For example: An installation is made with the specific purpose of heating to 70° with an outside temperature of 20° below zero—with 2 pounds pressure at boiler (219°). What portion of the load is in service under average conditions of outside temperature 40° above zero and room temperature 70°? The heat loss from radiator being the same the load will vary directly as the difference between outside and inside or

$$\frac{\text{Max. load } 70-(20)=90}{\text{Aver. load } 70-(40)=30}=3$$

that is, the average load will be under above conditions one-third the maximum load; and for practical approximation the amount of coal used will be for average conditions one-third of that used under maximum conditions. Now how shall we determine the amount of coal for maximum conditions?

Since each foot of direct steam radiation or its equivalent will give off 240 b.t.u. per hour under conditions of 2 pounds (219°) pressure at boiler (70° air surrounding condensing surface) and the piping on the average job may be roughly taken as 25 per cent. of the direct radiation—and since for approximation we may assume 8,000 B.t.u. per pound of anthracite coal burned, we can estimate amount of coal per hour by the folowing:—

$$(1)\quad \frac{1.25\text{x}R\text{x}240=R=\text{amt. direct radiation}}{8{,}000 \quad C=\text{coal per hour}}$$

In a heating season of 7 months 210 days of 24 hours each there would be burned under maximum conditions during the entire period

$$(2)\quad \frac{1.25\text{x}R\text{x}240\text{x}210\text{x}24}{8{,}000\text{x}2{,}000}=\text{max. tons coal.}$$

But we have seen above that if installation is figured for 20° below zero and the average temperature is 40° that only one-third the maximum is

$$\frac{1.25\text{x}R\text{x}240\text{x}210\text{x}24=\text{tons burned per season}}{8{,}000\text{x}2{,}000\text{x}3 \quad \text{approximately}}$$

If R—1 then this equation resolves itself into .0315 tons per foot of radiation per season or 3.15 tons per hundred feet (R-100).

For water heating under similar condi-

(Continued on page 27.)

*From Ideal Heating Journal.

Text of New Agreement

Increase in Wages Granted—A Good Feeling Prevails Between Both Employers and Journeymen, a Condition Which, Without Doubt, is Beneficial to All Concerned and is Therefore Commended

ONE of the most important matters taken up and dealt with at the recent meeting of the Toronto Socity of Sanitary and Heating Engineers was that of a new scale of wages and agreement. After exchange of a few ideas in a general way, it was felt that the troublous times that prevailed sufficiently warranted the advance granted, which amounted to 15 cents per hour. The following is a true copy of the agreement as now exists from this date onward for a period of two years:

Agreement

Articles of agreement mutually made and entered into between the Toronto Society of Domestic Sanitary and Heating Engineers, as parties of the first part, and Local Union 46 of the United Association of Plumbers and Steamfitters of the United States and Canada, as parties of the second part, with a view to promoting the business of heating and sanitation, to organize those persons who are qualified therein, in order to allow these trades to insure a standard of efficiency for the protection of the public, and for those persons engaged in such business, by the establishment and maintaining of fair conditions and settling of differences that may arise between the members of the respective organizations parties to this agreement, and to maintain industrial peace.

Clause 1.—The hours of labor shall be from 8 a.m. to 5 p.m., with one hour for lunch, for five days, and on Saturdays from 8 a.m. to 12 noon.

Clause 2.—The minimum rate of wages for all journeymen shall be 65 cents per hour.

Clause 3.—Overtime shall be paid for at the following rates:—To 12 p.m., time and one-half, and from 12 p.m. to 8 a.m. double time. Sundays and the following holidays shall be paid for at the rate of double time:—New Year's Day, Good Friday, Victoria Day, Dominion Day, Civic Holiday, Labor Day, Thanksgiving Day, and Christmas Day.

In cases of absolutely necessary repairs in which damage is liable to be done, and finishing up a repair job on regular working days, if such work will not take more than one hour's time, it shall be done at the regular rate of wages.

Clause 4.—Men working out of Toronto shall have their fare and board paid. Time travelling to and from such work shall be paid at the rate of single time only up till 9 p.m. If travelling at night a sleeper to be provided. In localities where no local union of the U. A. exists the hours of labor may be extended to 10 hours on regular working days at the rate of single time.

Clause 5.—The parties of the first part agree to use their efforts to the end that all plumbers and steamfitters in their employ at present or those to be employed in the future (during the period of this agreement) shall be members of the United Association.

The parties of the second part agree to use their efforts to the end that no member (of their association) shall do any work pertaining to his trade for anyone but a licensed sanitary or heating engineer, protecting city plumbing by-law No. 6,388, section 70.

Clause 6.—All apprentices shall serve their apprenticeship continuously in one shop, unless otherwise agreed upon, and shall pass a satisfactory examination as herein provided for before a joint examining board, mutually agreed upon by the parties to this agreement.

An apprentice when deeming himself competent to use the tools shall apply to the joint examining board through his employer for examination, and if successful he shall be permitted to work with the tools for the employer making the application for a period of two years, and shall not receive less than 35 cents per hour in the first year and 45 cents per hour in the second year. After that time he shall receive the minimum rate of wages according to this agreement.

Should the applicant after passing the examination leave the employer who has made the application he shall not be recognized by the parties to this agreement as other than a journeyman, and shall only be employed as such. No more than one apprentice from each shop can apply for this examination during any one year, unless where there are more than five journeymen employed, when they can make application for one apprentice for every five journeymen regularly employed.

If an applicant fails to pass the examination he must return to work helping for six months, after which period he may again apply for examination.

Clause 7.—Each steamfitter will be allowed one apprentice only. Any additional help that may be required to be laborers, who shall not be classed with steamfitters' apprentices or plumbers' apprentices, and will not be permitted to handle the tools of the trade.

Clause 8.—In case of any grievance arising between the parties to this agreement which cannot be adjusted by the representatives of both organizations it shall be referred to a joint arbitration board, composed of three masters and three journeymen, mutually agreed upon; said board shall meet within 48 hours, and shall have full power to settle such grievance and appoint an arbitrator if necessary.

Clause 9.—In the event of a dispute arising which cannot be settled satisfactorily by the Joint Arbitration Board, or any violations of the clauses of this agreement by Local 46, that before any definite action is taken the matter be referred to the general office of the United Association, and no strike or lockout shall take place until an officer of the said association has investigated the matter and rendered a decision.

Clause 10.—This agreement shall become effective July 1st, 1918, and remain in force until June 30th, 1920, and should either party wish to change, add, or amend the above agreement they shall give at least one (1) month's notice in writing prior to the termination of this agreement, with the proposed changes attached. Providing no such notice is given by either party one (1) month prior to July 1st, 1920, this agreement to remain in force from year to year until such notice is given as herein provided. When such notice has been served it shall be the duty of the joint committee to convene within thirty days and come to a decision.

Signed in the City of Toronto, **June 21st, 1918**, on behalf of:

Toronto Society of Domestic Sanitary and Heating Engineers.

GARRETT F. FRANKLAND,
Secretary.

Local Union 46 United Association of Plumbers and Steamfitters.

T. H. MOSSES,
Secretary.

United Association of Plumbers and Steamfitters of the United States and Canada.

JOHN W. BRUCE,
General Organizer.

Giving Employment to Returned Army

35,000 Home and 60,000 Disabled Men a Possibility Any Time — Study of Problem Shows it Requires More Than Superficial Thought

Written for MacLean Publishing Co. by C. Norman Senior, Department of Soldiers Civil Re-establishment.

MERCHANTS and manufacturers of Canada, along with the industrial and commercial communities in all the belligerent countries, to-day face in the returned soldier problem a condition which, if left to solve itself, will undoubtedly do so at the expense of their prosperity. Employers, along with all other classes of the community, are vaguely aware that the military authorities have returned 35,000 soldiers from overseas as unfit for further military service. They know also that if the war were to end to-day another 20,000 to 25,000, who are still in English hospitals, would gradually be brought back. That this army of disabled represents a definite national problem which has to be grappled with, not only by Government departments, but by individual employers, is what may not yet have registered as self-evident.

Patience Required at First

Everybody has been urged to employ returned soldiers. Probably the merchants, publishers, etc., have done as well as any section of the community. But the problem of this 60,000 is ever so much bigger and broader than mere employment. This will also be found true of the fit veterans when they return after the war, for the nerve-shattering experiences of the battle front do not leave men in the same condition as before. Just what is meant may be gathered from the remarks of a returned major, who now occupies a position as vocational officer with the Department of Soldiers' Civil Re-establishment. Addressing an audience of factory managers upon some of the problems which would confront them in employing returned soldiers, he said:

"When I came from the front to Canada, even after I had had a good furlough, the first morning my duties commenced I could not stay more than one hour at my desk, I was so excited and nervous."

The inference may as well be drawn right here in the words of this officer himself:

"Therefore, tolerance and human kindness towards the returned soldiers are what we ask of you who are or may be in charge of these fellows."

Not a few who have employed returned soldiers have reported that they found them "good for nothing," and were compelled to discharge them; sometimes the men did not even wait to be discharged, but took French leave of their positions for no apparent reasons. These incidents have occurred and will occur again, but the major pointed out to his audience of factory managers that anybody who has seen how these men behaved on the battle front, their coolness, their self-sacrifices to help their comrades, their bravery in the very face of death, could not believe that these were the men who would fall down on an ordinary job. The point he made was that some foremen and superintendents were too quick to reprimand and were not tactful in realizing that they must follow different methods in dealing with men who had been through the awful experiences of this unprecedented war.

Use Tact and Less Reprimand

Other employers, whose tactfulness had been adequate for the occasion, had found that after a short period of tolerance of certain irregularities the men had responded and made loyal, efficient employees, eager to give the maximum of satisfaction. A heart-to-heart talk with the returned soldier employee who may be acting in an unsatisfactory manner was urged as an unfailing remedy.



Disabled soldier, a former newspaper artist, receiving instruction in painting.

The discharged soldier was at heart earnest and determined to succeed in civil life, but his nerves and powers of concentration were not equal to all situations for the first few months, the major declared.

Now, just why should employers go to all that trouble with one class of employees? A lot has been said about gratitude to the returned soldiers, patriotism, etc. It was worth saying, and has been well said, but there are more powerful reasons even than those. At the present time there are 35,000 men in Canada who have done with their military service. This is no small group, and it consists entirely of young, mentally active men who three or four years ago were fit for anything, and who are now restricted in their scope as a result of their injuries. Thoughtless antagonism or even indifference to their welfare might easily impede the task of absorbing them into the community, by accentuating their temporary difficulty in settling down until it developed into real aversion for work under conditions as they found them. The demoralizing effect upon all classes of the community from a crystallization of this very real danger can easily be imagined. No business man needs to have any more than a casual reference made to the evils attending upon the presence in the community of a large unemployed section. Particularly in Canada, a young country, would the presence of a large non-productive element be harmful.

Returned Men Take Up New Employment

It should be remembered also that these first returned men are the ones who will control and guide the great bulk of our army when it returns after the war. If a spirit of resentment due to real or imagined injustice grows, the whole body of returned soldiers will respond very quickly and the business community would find the antagonism thus engendered very difficult to cope with. The general public is behind the soldiers in almost every stand they take, and this is a circumstance which should not be overlooked.

About one-tenth of the soldiers returned so far, it has been found, are so disabled that they cannot resume their pre-war occupations and be self-supporting. The country has undertaken the obligation of giving these men what is known as vocational re-education. That is, it trains them for new occupations in order that they may be self-supporting. It is the well considered aim of those responsible for the vocational training policy of the Department of Soldiers' Civil Re-establishment to protect the industrial community as well as the disabled men by training the veterans in as many widely different occupations as possible. No one industry or occupation should become overcrowded with disabled men, even though it is recognized that certain classes of work are easier to teach to injured men than are others.

(Continued in next issue.)

THE GUM RATION

Harry (just out)—Listen, Bill! Sounds like old Fritz comin' over in the mud—squish squash, squish squash.

Bill—That's orl right—that's only the Americans further up a-chewing their gum rations.

Tests and Designs of Air Lift Pumps

The Air-Lift Pump Has Become One of the Most Economical Methods of Raising Water—The Simplicity of Construction and Almost Entire Absence of Moving Parts a Unique Feature

By A. W. Purchas*

Operation of the Pump as a Whole

THERE are different methods of approaching this question, one of which was given by Dr. H. Lorens. This takes account of friction and slip, but starts off with a "constant" which the tests of Messrs. Davis and Weidner showed to be as variable as any quantity can be. This theory is not reproduced here as it is cumbersome, and does not bring out the features of operation of the pump.

Another method of approaching the subject brings out better than either of the foregoing the details of operation of the process, and may be called the Displacement Theory. Fig. 7 represents the pump prior to the injection of any air. Since the base of the eduction-pipe is open, the pressures on both sides of the horizontal plane X—X are equal, and the liquid stands at the same height inside the pipe as outside.

Fig. 8 represents the conditions after a single bubble of air has been injected. The weight of this bubble of air is negligible when compared with an equal volume of liquid, and the bottom of the eduction-pipe being open the pressure on the two sides of the plane X—X will remain balanced; therefore there must remain in the eduction-pipe after the injection of the air the same volume of liquid as before. The liquid displaced by the air must therefore move upwards, raising the surface of the liquid inside the eduction-pipe above that outside.

Let H be the amount of the rise.

V be the volume of the air bubble,

and A be the cross-sectional area of the eduction-pipe. Then

$$H = \frac{V}{A}$$

The injection of the volume V of air has done work equal to ½VH due to displacement alone, but the bubble will rise through the column of liquid, expanding as it does so and thereby increasing H. Neglecting friction, none of the energy originally contained in the air-bubble is lost until the bubble breaks the surface of the liquid and escapes into the atmosphere. When the air has finally escaped, then it may be said that the energy has been wasted in slip; but not before.

Supposing the air to be injected into the eduction-pipe at such rate that before the first bubble escapes to the atmosphere the total volume accumulated in the eduction-pipe, say V^t is such that the head $\frac{V^t}{A}$ is greater than the lift L.

Then the pump will discharge a volume of liquid equal to A (H—L). This is the volume that is violently discharged when an air-lift pump is started up. The loss of this volume from the eduction-pipe produces an unbalanced head, equal to H—L, on the plane X—X, which will force more water into the base of the pump. From this point onwards the operation of the pump may be regarded as a head H—L forcing liquid into that area of the eduction-pipe, which is not already filled with air. Analysis of the published results of tests seems to show that the great loss in the pump is not by slip, but of this head H—L due to entry losses.

Tests yielding high efficiency always show either one or both of the following features: low velocity of the rising mixture through the foot-piece, or else a low ratio by volume of air to liquid at this point which is the result of great submersion. The effects of great relative submersion may, however, be offset in many existing wells by the relative high velocities of the mixture leaving the eduction-pipe with consequent high friction losses. All of which suggests that the eduction-pipe should be of as great cross-sectional area as the well permits from its base to at least the level from which the liquid is being raised. The loss by slip of this length is negligible, as we have seen, and the larger the pipe the less will be the loss of the head H—L. Above this point, however, the velocity of the rising mixture must lie between certain definite limits, otherwise the loss by slip will be excessive; therefore the area of the eduction-pipe must bear a definite ratio to the volume of mixture flowing through it. What this ratio should be cannot definitely be stated on the data at present available, but it is hoped that the ideas here put forward may lead to more thorough tests being made of pumps in the future, and the publication of the results.

If the velocity with which the air-bubbles will rise through the liquid can be calculated, then the total volume of air in the eduction-pipe at any instant of time can be found from the known rate of ejection. If this volume produces a head less than the lift, then with the submergence fixed, a greater rate of air-supply must be used for the pump to deliver any liquid. If the rate of air-supply is fixed, then a greater submergence must be provided, in which sufficient air can accumulate to produce the necessary head. A definite volume of air must be accumulated below the water surface inside the eduction-pipe for the pump to work at all.

At the other extreme it is conceivable that the air could be injected at such high rate as to entirely hold back all liquid from entering the base of the eduction-pipe, once the original contents were discharged. Such a state could hardly be obtained in any pump installation, but probably could be brought about with a 2-inch eduction-pipe, 12-inch air-pipe, and high rate of air supply. Experiments bear out these statements, for a series of tests on a pump at increasing rates of air supply show that below a certain rate there is no discharge. Above this point the discharge of liquid increases with the rate of air supply, and then begins to grow less as the rate of air supply is still further increased, Figs. 9, 10, 11.

This Displacement Theory also shows that the volume of air required to raise a given quantity of liquid is independent of the density of the liquid, if we neglect losses from friction and slip. However, the pressure equivalent to the required submersion, and therefore the energy contained in the air injected, varies as the density of the liquid.

Submersion of the Air Injection Foot-Piece

There is no rational formula known that will determine the most efficient value for the submersion, and only a few published tests touch on the point. Messrs. Davis and Weidner made many small scale laboratory tests which are very inconclusive. Mr. Edmund Ivens also records some tests on a large scale in his book, "Pumping by Compresed Air."

The Displacement Theory, already outlined, shows that the submerged portion of the eduction-pipe is primarily necessary as an accumulator for the air. As will be seen later (pages 25 and 26), there is no such thing as a definite volume of air required to raise a given quantity of liquid to a given height, as the volume of air varies according to the submersion adopted. This conception of an accumulator for the air suggests that greater proportionate submersion is required for low lifts than for high, and that rather than bear a fixed ratio to the lift, the most efficient value will bear a definite relation to the rate of air supply and cross-sectional area of the eduction-pipe.

Current practice favors greater ra-

*Read before the Institute of Electrical Engineers, November, 1917.

tios of submergence to lift the lower the lift, and the following values are a fair average:

Lift	Submersion Ratio—Submersion / Lift	Submersion
25 feet	4.00	100
50 feet	3.00	150
75 feet	2.33	175
100 feet	2.00	200
150 feet	1.70	255
200 feet	1.38	275
250 feet	1.22	305
300 feet	1.00	300

Messrs. Davis and Weidner report as the result of 108 tests on a lift of five feet with submergence varied from 30 to 88 per cent.: "The efficiency increases as the percentage of submergence increases for all rates of input, and all practical percentages of submersion." It seems quite possible that a rational formula for determining the most efficient submergence may in time be developed from the Displacement Theory.

A Method of Designing Air-Lift Pumps

To the designer who lacks the data which the larger manufacturers have accumulated, the following method is suggested:

Let L be the lift in feet.

S be the submersion in feet.

V^w be the volume of water to be pumped per minute in cubic feet.

V^a be the volume of air required per minute measured at atmospheric pressure and a temperature equal to that of the water to be pumped.

P^a be the absolute pressure per square inch of the atmosphere.

P^s be the absolute pressure per square inch of the air under the submersion head S.

Then the energy supplied by the air to the water is:

$$144\ P^a\ V^a \log^e \frac{P^s}{P^a} \text{ — foot-pounds,}$$

and the work done on the water is 62.5 V^wL foot-pounds.

Then, if the efficiency of the pump were 100 per cent., these two quantities would be equal. In order to apply this method, two assumptions must now be made, namely, the submersion and the efficiency of the pump.

Submersion.—A guide to the probable best value for this has been given already, and these values may be taken, though it will be seen later that they may need modification as the design proceeds.

Accepting these values, then—

$$P^s = P^a + 0.434\ S.$$

Efficiency of the Pump.—This at first seems a very rash assumption, but it is the author's belief that a careful study of this and other papers will show that it is not so. The following test figures stand out as the best so far reported, and analysis of other published tests shows no reason why they cannot always be duplicated:

(1) With the reverse process of compressing air by entanglement with falling water, an efficiency of 81 per cent. has been obtained in Germany, and 71 per cent. at the plant of the Dominion Cotton Mills Co. at Magog, P.Q., Canada. This latter plant was the first installation designed on this principle.

(2) Series D of tests at Oilfields show that an efficiency of 72 per cent. can be obtained with an air-lift pump on lifts of 300 feet, and an analysis of other published tests suggests that in each case higher efficiencies could have been obtained at other rates of working, or by modification of the designs along the lines already outlined. Furthermore, most writers on the subject have in the past conceded that higher efficiencies are obtainable on low lifts than on high lifts.

There is good ground, therefore, for assuming an efficiency of 70 per cent. for all lifts up to 300 feet. This may not be obtained with the first eduction-pipe installed, but in the majority of cases the first eduction-pipe is not the final one, but is installed to find the service pumping level and the capacity of the well. A series of tests made on the first pipe at varying rates of pumping should enable the above efficiency to be obtained with the final one.

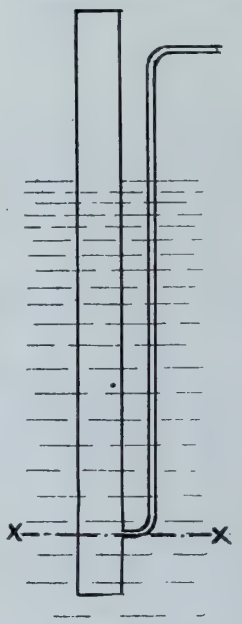


FIG. 7

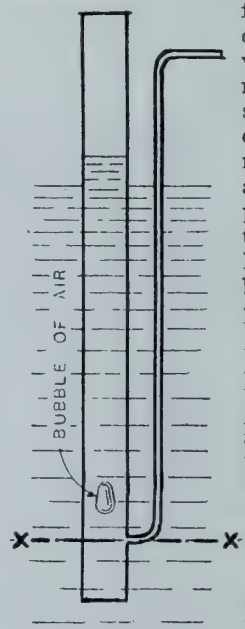


FIG. 8

These two assumptions being made, the volume of air and its initial pressure can be found from the formula:

$$0.7 \times 144\ P^a\ V^a \log^e \frac{P^s}{P^a} = 62.5\ V^w L.$$

It must be borne in mind that the above volume of air is not the same as the displacement of the compressor-piston. It is usually wise to have a reserve capacity in the compressor to cover such factors as encrusted eduction-pipe, a demand for greater output of water, and wear of the compressor itself. The manufacturers should therefore be given the fullest details, since the power required to deliver any volume of air varies very widely with the speed of the compressor, and the ratio of the desired output to the full capacity of the machine. It may be noted here that high volumetric efficiency alone is not the desirable feature of a compressor, nor high mechanical efficiency alone, but the highest combination of the two. The best machine is that which will deliver the required volume of air at the given pressure with the least expenditure of energy in the prime mover. Some of the latest designs of air-valves obtainable do not promise high volumetric efficiencies, but they conduce to high over-all efficiency.

Reference to the tests in the tables will show that 40 per cent. of the energy generated by the prime mover may be wasted in the compressor itself, and therefore that as much attention should be paid to the choice of the air-compressor as to the design of the eduction-pipe and foot-piece.

Having finally determined the best value for the air-pressure, submersion and volume of air required, the air piping, foot-piece and eduction-pipe can be designed. In proportioning the air-pipe, allowance should be made for the temperature of the air leaving the compressor being high, and the volume the fore greater than would otherwise be the case. After making this allowance, the velocity of the air in the pipes should not be over 20 feet per second. The design of a foot-piece has already been discussed, and will not be repeated here, neither the design of an eduction-pipe along the lines suggested by the Displacement Theory. But to enable others to reproduce the design, of which series D of tests in the tables show the capabilities, the original calculations for this pump are here given:

Assumptions and Conditions Based on Previous Tests of the Same Well

Volume water to be raised per second, 0.50 cb. ft.
Volume of air measured at atmospheric pressure and 70° F. required per sec. 3.30 cb. ft.
Lift ..... 300 ft.
Total length of eduction pipe..... 625 ft.
Velocity of rising mixture to be maintained, between .....8 and 15 ft. per sec.
Air pipe to be kept outside eduction pipe.

Available pipe of suitable dimensions:

Nominal Size	Actual I.D. inches	Cross-Sect. Area sq. ft.
4-inch line pipe	4	0.087
5 3/16-inch casing	5	0.136
6⅝-inch casing	6¼	0.210

Calculations

Pressure of air on leaving foot-piece —141 lb. gauge—3.30 cub. ft. of air at atmospheric pressure, and 70° F., will be 0.308 cub. ft. at 141 lb. per sq. in. gauge pressure, and 70° F.

The increase in volume of the air is 3.30-0.308 cub. ft. in a length of 625 ft. of eduction pipe, equivalent to 0.0048 cub. ft. per foot-length of pipe.

For a velocity of 15 ft. per second in 4-inch pipe, the volume flowing must be 1.305 cub. ft., which in this particular case will consist of 0.5 cub. ft. of water and 0.305 cub. ft. of air. If L be the feet of 4-inch pipe required between the foot-piece and its junction with the next larger size, then:

$$0.805 = 0.308 + 0.0048\ L,$$

whence $L = 103$ feet.

In the next proposed size—5 3-16-inch casing—a velocity of 15 feet per second will require a volume of 2.10 cub. ft., which will be composed of 0.5 cub. ft.

of water, and 1.60 cub. ft. of air. Calling the required length of 4-inch and 5 3-16 inch pipe combined L_1, then:

$$1.60 = 0.308 + 0.0048\ L_1,$$

whence $L_1 = 270$ feet,

and the length of 5 3-16-inch required is 167 feet.

	ft. per sec.
At foot-piece	9.3
At top of 4-inch pipe	15.0
At bottom of 5 3/16-inch pipe	9.3
At top of 5 3/16-inch pipe	15.0
At bottom of 6⅝-inch pipe	10.0
At top of 6⅝-inch pipe	18.0

Among the more important conclusions to be drawn, which have not been previously emphasized, are the following:

(1) The apparent lack of agreement of different tests with any definite laws is due to two main causes; one, that the volume of air stated to have been used is too often the displacement of compressor-piston, or too high a percentage of this, which introduces an error of 10 to 60 per cent.; the other is the lack of segregation of the losses. For scientific purposes it is obviously useless to lump together the losses in the compression process and those in the eduction-pipe. The former are fairly well understood, but the latter are quite unknown, and will remain so, as long as only tests of the over-all efficiency of installations are made. If the laws governing the losses in the pump proper are to be studied, then a test must give the energy contained in the air immediately after passing through the injection foot-piece.

(2) That the greatest loss in an air-lift pumping installation is in the air-compressor, and therefore that the best compressor is none too good for a permanent installation.

(3) That the next greatest loss is the loss of head at entry.

(4) That any formula for calculating the submersion required would be better stated in the terms of "the volume of air used per second, at a pressure equivalent to the head of submersion," rather than in terms of the lift. This is suggested by the displacement theory conception of the submerged portion of the eduction-pipe as a space for the air to accumulate and raise the water by displacement.

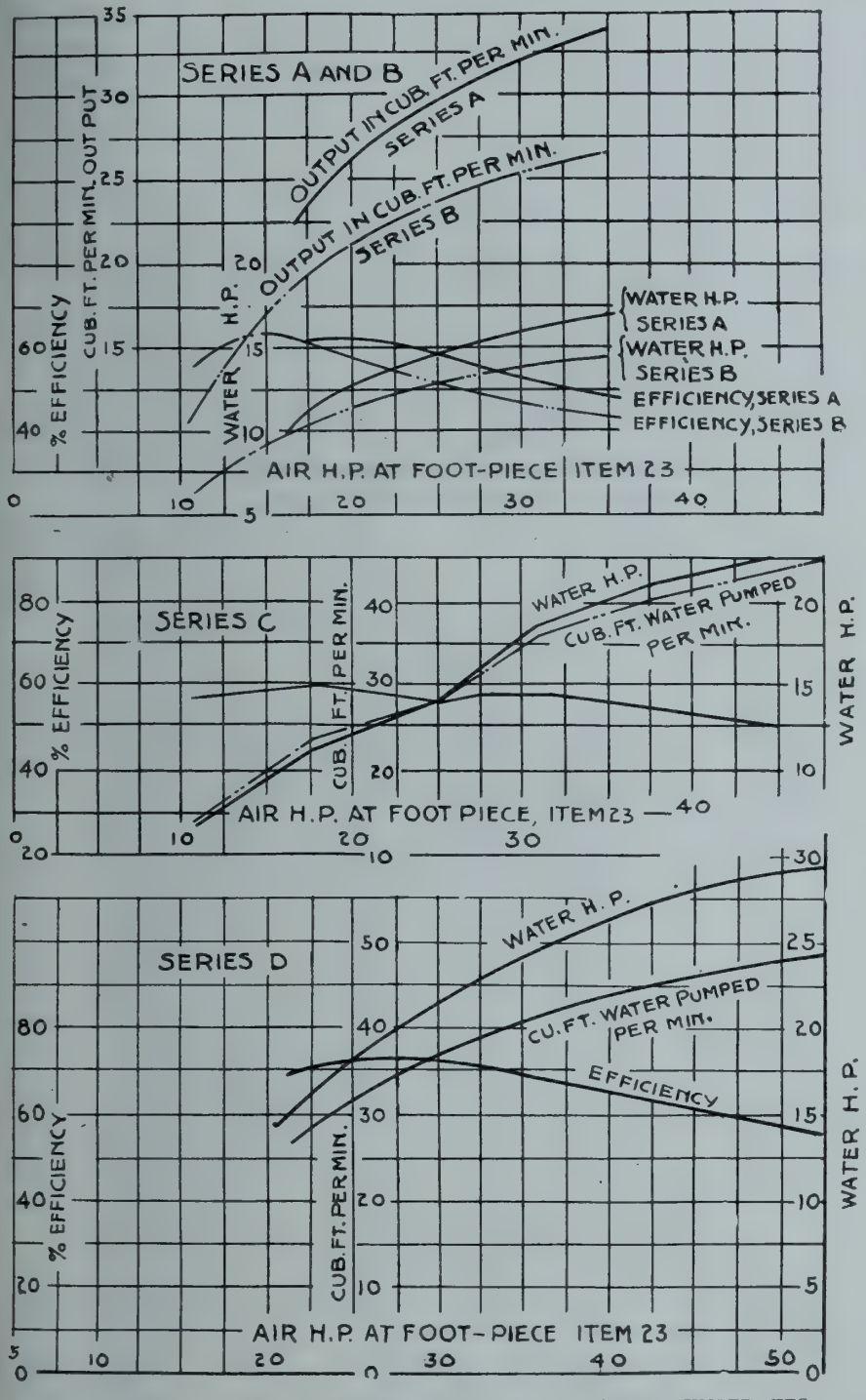
(5) That every ounce of compression which the air is compressed above that pressure, which is equivalent to the submersion head, is so much energy wasted, and that attention should be paid to the design of the foot-piece and the air-pipe with the object of reducing those losses to a minimum.

(6) That a valuable item of information to include in the report of any test is the ratio of the volume of air to water at a point immediately above the foot-piece, and that the ratio by volume of air to water at the outlet of the pump is of little comparative value, since the volume of air is not a measure of the energy contained therein, unless the initial pressure is included in some form.

(7) That the hotter the liquid to be pumped, the higher will be the efficiency of the pump. It has been shown by Professor Randall that an efficiency of 100 per cent. is possible under certain conditions when pumping water at 200° F.

(8) That many flowing oil-wells are in reality "air-lift" pumps, using natural gas in place of air. Mr. A. T. Beazley, A.M.I.C.E., has obtained very encouraging success in making wells flow which had previously to be pumped, by applying to them the principles of the air-lift pump. The great obstacle to be overcome is the lack of control both of the quantity of gas and oil, and of the point of mingling of the two.

(9) That considering the different forms of steam-engine usually used in conjunction with different types of pumps, that the fuel consumption of an air-lift installation can be made to compare very favorably with that of any other type for raising liquid more than 75 feet from a well. For shallow wells centrifugal pumps will probably prove more economical.



FIGS. 9, 10, AND 11, SERIES A. B. C AND D. WATER PUMPED, ETC.

Hence pipe desired is composed of: :

105 feet of 4-inch line pipe.
167 feet of 5 3/16-inch casing, and
355 feet of 6⅝-inch casing—a total length of 625 feet.

[Note.—6⅝-inch casing is the largest size pipe available which can be inserted alongside the air-pipe in the well.]

Using the above lengths of pipe, the average velocity of the rising mixture will be:

Building Operations Ahead of Last Year

Building Takes Upward Swing in Month of May — Thirty-six Canadian Cities Report Over Five Million in Permits—For First Five Months of 1918 Building Exceeded $12,500,000, and Was $500,000 in Excess of 1917

A decided improvement in the building situation in Canada is disclosed by the returns of building permits issued during the month of May in the thirty-six largest cities of the Dominion. The value of permits for the month exceeded five million dollars, a gain over May, 1917, of approximately a million and a half dollars. This good showing has had its reflection on returns for the five months of the year to date and whereas up to the end of April there was a decline, to the end of May there has been an increase of over half a million dollars.

Twenty-four eastern cities reported permits of $3,961,210, as against $2,779,461 a year ago, an increase of $1,181,749. Twelve western cities issued permits to a value of $1,062,234, which, as compared with 1917 was a gain of $256,169. It will thus be noted that the improvement was widespread and was shared in by both eastern and western cities.

Toronto Took Lead

Among eastern cities, Toronto took the lead with $877,508 in permits, a gain of $222,081. Montreal stood second with $658,680, a gain of $490,054. Port Arthur came third, its permits aggregating $525,375. In Halifax, building to the extent of $298,940 was permitted. Sixteen of the twenty-four cities reported gains, these ranging from $506,818 in the case of Port Arthur to $15,869 in the case of Westmount.

Among western cities the largest value in permits was shown by Winnipeg, where $300,700 was the amount issued. Vancouver stood second with $261,845 and Moose Jaw third with $211,855. So far as gains and losses over 1917 are concerned seven cities reported gains and five showed losses. The largest gain was made by Vancouver where permits for May, 1918, were $213,870 in excess of those for May, 1917. A satisfactory gain was also made by Moose Jaw where permits were $183,430 greater. Winnipeg, despite its comparatively large issue of permits this May, was $160,250 behind last May.

Five Months' Record

For the first five months of 1918, the best showing has been made by Toronto, where permits to the value of $2,734,951 have been issued. Montreal's permits amounted to $1,742,005, and those of Winnipeg to $706,000. The largest gain must be credited to Calgary, where an improvement of $570,900 over 1917 is to be noted. Regina stood up well with $424,995, while in Halifax the gain amounted to $412,795. The heaviest loss was shown by Hamilton, with a decline for the five months of $514,263.

INVESTIGATE HOUSING

Committee Appointed Under the Resources Committee of Ontario

In compliance with the request made by a deputation that waited on the Government a few days ago, the following sub-committee of the Resources Committee has been appointed to investigate the housing conditions in the province of Ontario: Sir John Willison, G. Frank Beer, Rev. Peter Bryce, Ald. J. Gibbons, Capt. S. H. Marini, Thos. Roden, H. H. Williams, M. J. Haney, H. V. F. Jones, H. C. Schofield, J. H. McKnight, R. B. J. Duncan.

The subject is essentially a municipal one, and some municipalities have already active committees dealing with the question. Therefore, for the present, no representatives from outside cities and towns have been appointed on the committee.

Sir John Willison, chairman of the commission, states that the commission has not yet held a meeting, and so far he only knows the views on the subject entertained at the Toronto City Hall and the conditions reported by manufacturers.

A DESERVING CASE

He had captured a prisoner, and while they were waiting for the escort to come up he said, "Have you got a wife?"

"Nein," answered the German.

"Nine!" gasped the Tommy, "Blimy! Where's yer Iron Cross?"

BUILDING PERMITS MONTH OF MAY

	May, 1918	May, 1917	Change	5 mos., 1918	5 mos., 1917	Change
Eastern Cities						
MARITIMES—						
Halifax	$ 298,940	$ 174,311 +	$ 124,629	$ 775,106	$ 362,311 +	$412,795
St. John	143,000	16,400 +	126,600	222,475	404,400 —	181,925
Sydney	55,667	31,050 +	24,617	134,897	95,768 +	39,129
QUEBEC—						
Montreal	658,680	490,054 +	168,626	1,742,005	2,108,914 —	366,909
Quebec	252,562	123,297 +	129,265	439,654	736,457 —	296,803
Westmount	39,950	24,081 +	15,869	75,950	33,346 +	42,604
ONTARIO—						
Brantford	182,825	9,795 +	173,030	231,825	44,300 +	187,525
Galt	53,395	24,820 +	28,575	71,535	57,130 +	14,405
Hamilton	134,800	352,765 —	217,965	586,457	1,100,720 —	514,263
Kingston	50,770	18,264 +	32,506	102,474	66,087 +	36,387
Kitchener	29,660	17,255 +	12,405	61,275	112,282 —	51,007
London	83,090	95,590 —	12,500	231,675	258,920 —	27,245
Ottawa	135,475	185,650 —	50,175	295,376	471,125 —	175,749
Peterborough	54,255	21,018 +	33,237	74,795	69,923 +	4,872
Port Arthur	525,375	18,557 +	506,818	557,031	371,516 +	185,515
Stratford	19,680	34,665 —	14,985	37,525	91,258 —	53,733
St. Catharines	110,662	74,955 +	35,707	207,807	210,775 —	2,968
Toronto	877,508	655,427 +	222,081	2,734,951	2,632,984 +	101,967
Woodstock	22,147	24,636 —	2,489	49,022	51,432 —	2,410
Welland	93,029	37,846 +	55,183	176,724	133,195 +	43,529
Windsor	89,905	116,955 —	27,050	281,410	474,660 —	193,250
Chatham	39,190	20,220 +	18,970	58,710	36,095 +	22,615
Fort William	4,930	200,000 —	195,070	188,320	334,715 —	146,395
St. Thomas	6,715	12,850 —	6,135	15,595	29,825 —	14,230
Total 24 E. cities.	$3,961,210	$2,779,461 +	$1,181,749	$9,352,594	$10,288,138 —	$935,544
Western Cities						
MANITOBA—						
Brandon	$ 4,354	$ 18,330 —	$ 13,976	$ 16,431	$ 66,830 —	$ 50,399
Winnipeg	300,700	460,950 —	160,250	706,000	847,650 —	141,650
ALBERTA—						
Calgary	63,600	53,500 +	10,100	680,200	109,300 +	570,900
Edmonton	44,820	74,050 —	29,230	83,055	88,200 —	5,145
Lethbridge	44,930	7,975 +	36,955	79,348	34,370 +	44,978
SASKATCHEWAN—						
Moose Jaw	211,855	28,425 +	183,430	267,855	140,495 +	127,360
Regina	53,350	46,025 +	7,325	529,010	104,015 +	424,995
Saskatoon	49,290	38,310 +	10,980	116,100	60,125 +	55,925
Prince Albert	2,740	16,300 —	13,560	5,118	19,115 —	13,997
BRITISH COLUMBIA—						
Victoria	21,050	4,675 +	16,375	158,190	30,880 +	127,310
Vancouver	261,845	47,975 +	213,870	606,555	281,339 +	325,216
N. Westminster	3,700	9,550 —	5,850	28,550	35,120 —	6,570
Total 12 W. cities.	$1,062,234	$ 806,065 +	$ 256,169	$3,276,412	$1,817,439 +	$1,458,973
Gr. to. 36 cities.	$5,023,444	$3,585,526 +	$1,437,918	$12,629,006	$12,105,577 +	$523,429

SANITARY ENGINEER

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ARE YOU PLANNING AND HOW?

ONE of the best things one can do when planning for new and bigger business is to ask oneself, "Is the work necessary?" Will doing the work now assist in any way to win the war? Or will the cost of doing without this work be a greater loss to the country at large if the work to be done is left until after the war?" These and many other questions can be and should be given much thought, and, having found the answer, we should act accordingly.

Now, it is a well-known fact that there is a shortage of houses in almost every town or city in Canada, and when the fighting forces in each country at war have come back, where are they to be housed? Just for a moment let us consider that in Canada alone something like 500,000 men will return home. Most of these will require homes, simply because many of these men will take up farms. Many have married in the old land and will require to be housed, and many more whose families went into the homes of friends by way of lowering the cost of rents will also require housing accommodation.

It would be almost safe to say that in the neighborhood of 100,000 houses will be required from now until the war is over, and these houses are to be built, else it will be little short of a calamity if there are no homes ready for the boys when they arrive home. Therefore, it is to be seen that every sanitary and heating engineer should do some planning, so as to cope with business which should be created "right now." Houses must be built, and plumbing and heating will require to be installed.

The question of high cost of material then looms up, but what of it? There is no reason to believe that cost of plumbing and heating can be lowered. It was never high enough to pay a decent profit to either manufacturers or the trade.

How many manufacturers of plumbing and heating supplies are there who have been able to put aside as much money earned as profits as the average business man in other lines? Very few, and the same applies with the average sanitary and heating engineer. Therefore, when talking cost to a prospective customer, it would be by far the best to point out that nothing by way of reduction can be hoped for in cost of installation.

There is another point not to be forgotten and that is that the most easily installed fixtures should be bought, those which, while possibly costing a little more on the invoice, do not figure as high when in place, and still another matter not to be lost sight of, viz.: That every man should be furnished with the most up-to-date tools. Every man should be told that in doing a job just as quickly as possible he is doing his bit towards winning the war.

The time-wasters these days are the Kaiser's best friends. So that from the above it will be readily seen that every journeyman and employer should plan to put more into every minute of one's time so that buildings may not be as costly in the end as would be the case if just an ordinary day's work is done. And not only so but every employee and employer should also do his utmost to create new business.

PRACTICAL METHODS OF FUEL CONSERVATION

FACTORY owners in the United States are being actively assisted by the Federal Fuel Administration in the matter of effecting fuel saving.

The question of how much coal a factory can get is not any more important than knowing how to get the most heat from the coal after it is received.

The mode of operations is on somewhat similar lines to the "greater production" propaganda recently carried out. A board of competent engineers is recommended to be attached to a conservation committee in each State, while a corps of lecturers will be employed to arouse public interest and disseminate engineering information.

A fifty-minute film of moving pictures will demonstrate good and bad methods of operating steam plants, while methods of testing boilers, fuels, etc., will be similarly dealt with.

The prospect of possibly harder times regarding fuel will make all factory owners and power users approve of such missionary work. Despite the prevalence of electric power in most Canadian provinces, the consumption of coal is plenty high enough to make imperative every possible economy of fuel.

Many factories are over-heated in winter, necessitating the discard of some clothing by employees. Such conditions are criminal and their continued existence is a betrayal of the country's welfare. Such propaganda as outlined above should bring all parties to a sterner realization of conditions as they will actually be in the coming winter.

Preparedness and Efficiency are indeed the watchwords of the hour.

Monthly Meeting of D.S.& H.E.

Good Attendance of the Members—Journeymen's Agreement and Wages Scale—Secretary's Report—Report of Committee on Cost of Collective Advertising—New Members

THE monthly meeting of the Toronto Society of Domestic Sanitary and Heating Engineers was held at the Foresters' Hall, College Street, on June 19th. There was a large attendance of members.

The secretary's report to the executive committee was read as was also the report of committee, under the chairmanship of Mr. Roy E. Belyea, appointed to investigate the cost possibilities of collective advertising.

Details of the agreement and wages scale settled upon with the journeymen will be found elsewhere in this issue.

The question of a summer picnic was brought up and discussed and it was decided to leave the matter in the hands of Mr. Harry Farthing, who will arrange a date for July or August for a family basket picnic to the Island Park. Two new members were initiated, G. E. Wimpenny and E. Byrne, of Wimpenny & Byrne, 59 Boone Ave., Toronto.

Following is a resume of the secretary's report to the executive committee:

Gentlemen,—In accordance with a request made at the last meeting of the executive committee I beg to submit a short account of the work accomplished by the society since its inception, together with one or two suggestions for the improvement of the conditions under which we are working.

A comparison of conditions as they prevailed in 1908 with those obtaining to-day will afford an eloquent reply to the oft heard query, "What has the society done for the craft in Toronto?"

After the labor troubles of 1906 there was a large accession of members to our craft, in fact the number of masters was greater than that of the journeymen, with results paralyzing to business, for the methods adopted by the inexperienced newcomers were such as would rapidly have ruined any trade if persisted in.

The older members of the craft then decided to place it on a more stable foundation, and my relationship with them from that time enables me to say with confidence that we have to-day a society which is imperishable so long as the members adhere to its constitution.

The first accomplishment of note was the appointment of a supervisor of the plumbing department. Then came a general revision of the plumbing by-laws.

The education of the individual member was looked after by the compilation of estimate sheets which eliminated guess work in giving tenders, and standard methods of bookkeeping were gradually adopted by the members.

The enactment of our present license regulations has been of inestimable benefit and will do more than anything else to place our craft on a level with other professions.

The appointment of John E. Fullerton as instructor of plumbing at the Technical School followed the action taken by the society to further the technical education of the craft.

The removal of the plumbing department to the architect's office was noted as was also the formulating of heating regulations by the architect's office, though the desirability of having these regulations in force is a debatable point.

I will now refer to two most important phases of our business which cannot but have an important bearing on our welfare.

No. 1 is the buying end of our business. Here I would urge co-operation in buying, and we should then be able to buy to advantage. Other lines can co-operate successfully so there is no reason why we should not.

No. 2 is the selling end of our business. This is divided into two sections. First, the jobbing or repair end, which is no doubt making money for those who follow it, and second, the contract section. In this phase there are many obstacles to successful operation, but most of these can be overcome by our reporting system. Here, however, our membership as a whole do not carry out their obligations to their fellow members by doing their bit.

The report of committee appointed to investigate cost and possibilities of collective advertising presented by Mr. Roy E. Belyea was as follows:

Mr. President, Fellow Sanitary and Heating Engineers:

As chairman of the committee appointed to investigate the cost and possibilities of co-operative advertising, it is my privilege to present to you this report at the formulation of which five-sixths of the committee were present. I might say that only the support which I received from the committee assisted by Mr. Edwin Newsome, editor of "Sanitary and Heating Engineer," who so kindly gave the committee his able assistance, make this report possible.

Before going into details I would like to pass a few remarks re the necessity of the proposed co-operative advertising. For some time past the plumbing trade has had to labor under the innuendo that it was given over to roguery on a large scale, so that the more the individual sanitary engineer tried to deal honestly or profess honesty the more suspicious the public became of him, simply because the view referred to was the only view or idea of him that was given in the press and he has always been too tolerant of abuse.

Implicit confidence and good fellowship should always hold first place among the members of this society, while on the other hand there should be no winking at the transgressions of any member against the by-laws or square dealing with the people whether as individuals or bodies. I am tempted to use this occasion to protest against any spread of feeling against informers or reformers as you may choose to call them. It seems to me that too much of the contemptuous nature has been said about them while never a voice is raised in behalf of society at large whose existence depends on information. Why should we all conspire to assail the hand that holds the torch when we all agree that light should be thrown upon certain dark places? Should we not first exhaust our vituperation upon those who are making use of the darkness? Shoul we not in our general attitude toward wrong-doing in our own trade take our first position by asserting that society must be protected against the individual?—that society cannot exist except it be protected against the individual?

If this unselfish service were rendered more readily by this society, not in the selfish spirit, working only in our own interests but for the good of society, we should have at least advanced along the lines of socialism in its truest sense as I see it. It has become our duty to insist upon a cool and fair examination of facts as they are and place same before the public through the medium of the press.

The chairman sought what he believed to be the best source of public opinion, the editors of the daily press. During the several interviews he had it was found that the press was entirely in sympathy with the movement, believing it would yield abundant return according to the amount of effort put forward and earnestness displayed by the advertisers for public goodwill. Of course the fact that tact and skill would be necessary during the campaign was everywhere driven home to the chairman, but everything bids fair so far as the press is concerned.

I shall now read to you letters to the press showing various opinions re plumbers, one cool and collected and the other—well, it must have been written by another Rip Van Winkle for I do not believe that plumbers of to-day are as this man protrays them, if they were in our forefathers' time, or else he is habitually careless with the truth or drew on his imagination to take a crack at the too tolerant plumber.

Plumbers' "Time"

"Sir,—I note that the Plumbers' So-

ciety resent statements made at their expense.

"I remember an instance of standing one day waiting for a street car and overhearing a conversation between two plumbers. This was about the middle of the day, and they were comparing notes as to how much time they had worked up against customers that morning. One claimed about ten hours and the other somewhat more, in a morning of only four hours' actual time. In other words they had charged up against various customers over double time. Is this not a species of robbery?

"If this society wishes to set themselves clear they should invite publicity.

E. CALLENDOR."

Plumbing

"Sir,—As one who has had dealings with plumbers and knows something about their charges, I agree that if authentic publicity of alleged overcharges, and not imaginary cases, were given in detail, and the same investigated by a reputable society of plumbers, who in turn would give an unbiased decision due publicity, greater confidence would surely be the result between the public and plumbing trade.

"Having also read your report of plumbers' intention to investigate trade slander, I feel sure the great thinking public will join me in congratulating the Toronto plumbers on this move on their part to set themselves right with the people.

E. M. WOODS."

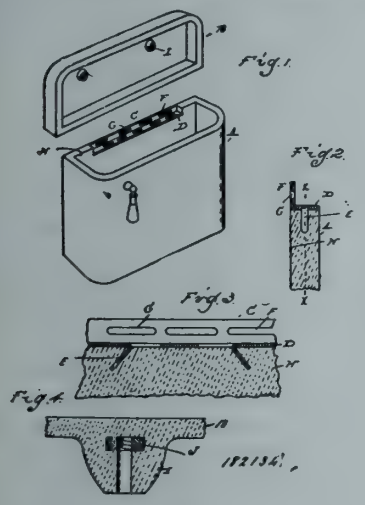
If at the end of the proposed campaign we have contributed anything toward dispassionate and judicial examination of facts without the superlatives with which the professional orator conceals his confusion of thought, I believe we shall be happy in the feeling of a great public service performed with beneficial results to ourselves.

New Canadian Patents

No. 182,134.

William J. Cluff, Toronto, Ontario, Canada, assignee of James M. Teahen, Detroit, Michigan, U.S.A., 5th February, 1918; Filed 30th November, 1917. Receipt No. 288,212.

Claim.—1. The combination with a composite tank, of an anchoring device therefor, comprising a metallic angle strip extending longitudinally of the wall of the tank and in a recess therein, with its upper edge substantially flush with the upper edge of the wall, said strip having anchoring prongs imbedded in the wall, and a slotted flange for engagement with the securing devices, and a



No. 182,134. Flushing Tank.

cover seated upon the upper edge of said tank.

2. The combination with a composite tank, of an anchoring device therefor, comprising a metallic angle strip having a vertical flange arranged substantially flush with the rear face of the tank wall, and a horizontal flange extending along the face of a recess in said wall, said horizontal flange being provided with struck-out prongs imbedded in the composite bobdy and the vertical flange being provided with a series of slots for the adjustable engagement of securing devices, and a cover seated upon the upper edge of said tank.

3. The combination with a composite open-topped tank having a recess at the top of one of its walls, of an anchoring device for said tank within said recess, said device comprising a metallic angle stirp having a horizontal flange rigidly engaged with the recessed wall, and having a vertical flange, the upper edge of which is substantially flush with the upper edge of said wall, and a cover seated upon the upper edge of said tank.

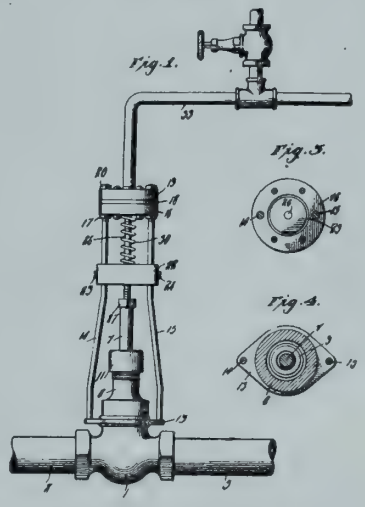
No. 182,034.

John Abner Lucas, Butler, Pennsylvania, U.S.A., 5th February, 1918; 6 years. Filed 21st December, 1917. Receipt No. 288,938.

Claim.—1. A valve comprising a valve casing, a valve mounted in said casing and having a stem extending therefrom, a diaphragm casing carried adjacent the valve casing and having a diaphragm mounted therein, a connecting rod arranged in line with the valve stem mounted to have movement transmitted thereto from the diaphragm as fluid pressure in the diaphragm casing is varied, and an adjusting nut fitted on the connecting rod to bear against the valve stem and through adjustment along the rod to give corresponding adjustment to the maximum opening of the valve.

2. A valve comprising a valve casing, a valve mounted in said casing and having a stem extending therefrom, a supporting structure mounted on said valve casing to extend beyond the stem, a diaphragm casing mounted on the supporting structure, a diaphragm carried by said diaphragm casing, a connecting rod mounted in alignment with the valve stem and arranged to receive movement from the diaphragm as the same is moved through the variation of fluid pressure in the diaphragm casing, and an adjusting nut mounted on the connecting rod and bearing against the valve stem to impart movement thereto from the diaphragm and to give adjustment to the maximum opening of the valve.

3. A valve comprising a valve casing, a valve mounted in said casing to be opened by fluid pressure and having a stem extending from the casing, a supporting structure mounted upon said valve casing, a diaphragm casing mounted on the supporting structure and having a diaphragm carried thereby, a connecting rod mounted in line with the valve stem and arranged to have movement transmitted thereto from the diaphragm, an adjusting nut mounted on the connecting rod to bear against the valve stem and transmit movement thereto upon distension of the dia-



No. 182,034. Valve.

phragm, and a spring mounted to normally hold the connecting rod in a position that the valve may be freely moved from a closed position subject to limitation of the opening movement by the adjusting nut.

No. 182,004.

Darcy Gilberd, Tuakau, Auckland, New Zealand, 5th February, 1918; 6 years. Filed 5th July, 1916. Receipt No. 267,433.

Claim.—1. A pump comprising a barrel, valvular pistons in the barrel, a

(Continued on page 32.)

Market Conditions and Tendencies

Statements Regarding the Prices and Trend of Supplies.

THE MARKETS AT A GLANCE

REVISED prices have been named in some quarters on valves, the standard globe, angles and check, and a couple of lines of radiator valves being affected. That the prices as now established will hold is somewhat doubtful, and the belief is expressed that the entire list of valves will shortly show increased quotations.

The situation in soil pipe and fittings grows increasingly difficult, and manufacturers see little chance of relief in conditions as they exist to-day. Production of pig iron cannot keep up with growing demands for war purposes, so it is not difficult to determine what the commercial trade must come to. Manufacturers to-day will only look at fully specified orders, and these are very carefully scrutinized before being accepted. In view of conditions, higher prices would not come as any great surprise, in fact, a complete withdrawal of prices is not unlikely.

Sheets, which have been rolling towards Canada in fairly liberal quantities up until a week ago, seem suddenly to have stopped, and dealers are really beginning to feel that there may be something in the recent Government order in the United States taking over the output of the mills. The market has firmed materially, and an advance of from 25 to 50c per 100 pounds on black sheets is reported in one source.

Manufactured lead products are very firm owing to the growing strength of the metal market, and intimations are that should prices on pig lead go much higher, the manufactured lines would be almost sure to follow suit. A fair amount of business is being transacted.

TORONTO, June 27.—New prices have been named on galvanized sheets representing an advance of 50c per 100 pounds. Black sheets have also firmed in some quarters, while others report a decline. An advance in the price of some lines of valves is recorded, which is expected to extend to other lines shortly. Soil pipe and fittings are very firm, and specified orders now have to be submitted to manufacturers for their approval before acceptance. Manufactured lead products are very firm following advances made in the pig lead market. Business is reported fairly good.

No Change in Range Boiler Situation

RANGE BOILERS.—There is no change in the situation to be recorded since last issue. The advanced price on galvanized sheets has proved a firming feature with boilers, but no change in price has yet been made. Some sizes are still scarce. Quotations follow:

	Standard	Extra Heavy
30-gallon range boilers	$14.00	$17.00
35-gallon	17.00	20.50
40-gallon	20.50	24.00
52-gallon	28.00	32.00
66-gallon	37.00	42.00
82-gallon	45.00	50.00
100-gallon	62.00	70.00

Enamelware Holds Firm and Unchanged

ENAMELWARE.—The market shows little variation since last issue, prices holding firm at unchanged figures. The demand continues to show slight improvement, and it is thought will steadily improve.

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Sinks, roll rim, 18 x 30 in., staple	16 80
Closets, oak tank and seat	22 00
Do., enamel iron or white vitro tank	23 75

Firm Tone Noticeable in Soil Pipe, Fittings

SOIL PIPE, FITTINGS.—The market grows increasingly difficult and higher prices would not come as any great surprise. Pig iron is simply not available for commercial purposes, and when present supplies are absorbed manufacturers must watch stocks reach the vanishing point; they are by no means heavy now. Fully specified orders are the only ones manufacturers will look at and they are scrutinized pretty carefully before acceptance is given.

SOIL PIPE FITTINGS.

Medium and extra heavy soil pipe, 6-inch and under	35%	2½%
8-inch soil pipe		30%
Medium and extra heavy fittings, and under	40%	2½%

C. I. PIPE FITTINGS.

Cast iron fittings	10%
Cast elbows, tees, etc.	10%
Plugs	25%
Bushings	25%
Flange unions, standard	10%
Dart unions, ¼-inch to 2-inch	25%
Do., 2½ in. and larger	17½%
Nipples, up to 4-inch	45%
Do., 4½-inch and larger	40%
Do., running thread 4-in. and under	25%
Couplings, 4-in. and under	35%
Do., 4½ in. and larger	15%

MALLEABLE FITTINGS

Malleable Fittgs., Class A, lb.	0 55-0 56	0 66-0 70
Do., Class B., lb. net	0 24-0 25	0 34-0 35
Do., Class C., lb. net	0 16-0 17	0 24-0 25

Waste Unchanged; Oakum Steady

WASTE, OAKUM.—A fair amount of new business is offering in waste, and manufacturers are busy filling contracts on hand. Prices have held firm and unchanged.

Oakum is rather quiet at the present time, orders being none too free and quantities rather limited. Prices shown herewith are unchanged.

	Per 100 lbs.
Best American	$21 50
Clipper, spun	21 00
Do., unspun	19 50
Plumbers', spun	10 00

Some Valves Advance, More to Follow

VALVES.—An advance has been recorded in some quarters on some lines of valves, and further revisions are expected to cover more nearly the complete range within the near future. This is in line with predictions made in SANITARY ENGINEER in the last issue, and it is indicated these new high prices are fully justified under present conditions—difficulty getting raw material and continually increasing production costs. Present quotations range as follows:

	Discount off list
Ground work	50
Compression work, standard	52
High grade	45
Cushion work	46
Fuller work, standard	50
High grade	43
Basin cocks, No. 0 standard	46
Nos. 1 and 2	46
Bath cocks	53
Flatway stop and waste cocks, standard	53
High grade	50
Roundway stop and waste cocks, standard	53
High grade	50

Brass steam cocks, standard	Net
Globe, angle and check valves, standard.	Net
Do., removable seat	Add 5%
Radiator valves, standard	10
Do., removable seat	5
Patent quick opening valves	35
Basin Cocks—	
No. 0 and 1, Fuller pattern	50
Globe, angle and check valves, standard, medium pressure	30
Do., removable seat, medium pressure	30
Radiator valves, standard medium pressure	40
Radiator valves, removable seat, medium pressure	40

Wrot Iron Pipe Very Firm; Getting Scarce

WROUGHT IRON PIPE. — When manufacturers have exhausted present stocks of raw materials, the future presents anything but a bright outlook. Shipments of raw materials are not coming through and stocks on hand are generally considered light. This has provided an extremely firm element in this market and the possibility of higher prices seems nearer a probability. Prices appearing in box herewith show no change:

Boiler Tube Scarcity Becoming Marked

BOILER TUBES.—Boiler tubes are increasingly scarce and stocks have dwindled to the vanishing point, with apparently little prospect of their being replenished. Quotations are unchanged on the following basis:

Toronto—	Per 100 feet Cold drawn	Lapweld
1 inch	$36 00	$ ....
1¼ inch	40 00	....
1½ inch	43 00	36 00
1¾ inch	43 00	36 00
2 inch	50 00	36 00
2¼ inch	53 00	38 50
2½ inch	55 00	42 00
3 inch	64 00	50 00
3¼ inch	....	58 00
3½ inch	77 00	60 00
4 inch	90 00	75 00

Galvanized Sheets up 50c; Black up and Down

SHEETS, PLATES.—Prices on galvanized sheets have undergone revision upward, the advance amounting to 50c per 100 pounds. Supplies are not moving towards Canada with any degree of certainty and during the past couple of weeks this fact has become increasingly evident.

Some black sheets are reported in transit and a decline of 25c per 100 pounds has been made in some quarters, while others report an advance ranging from 25c to 50c, according to the gauge. Stocks are in very fair shape, though this condition may only be temporary, the amount released for future shipment to determine this factor. Business in sheets generally is fairly brisk.

BLACK SHEETS—	Per 100 lbs.		
10 gauge	$....	$10 00	$12 00
12 gauge	....	10 10	10 00
14 gauge	7 45	7 90	8 40
16 gauge	7 50	8 00	8 50
18-20 gauge	7 80	7 55	8 05
22-24 gauge	7 85	7 60	8 10
26 gauge	7 90	7 65	8 15
28 gauge	8 00	7 75	8 25
3-16 inch plate	....	10 10	10 25
¼-inch boiler plate	....	....	10 00
GALVANIZED SHEETS—			
10¾ oz.		$9 50	$9 75
U.S. 28		9 20	9 45
U.S. 26		8 90	9 15
22 and 24		8 75	9 00
18 and 20		8 60	8 85
16		8 45	8 70
14		8 35	8 60

Lead Products Very Strong; Solder Holds

LEAD AND ZINC PRODUCTS.—A further advance in pig lead has firmed the market on manufactured lead products to that extent and manufacturers indicate that should the metal go much higher they will be compelled to advance their lines. The demand is only nominal at the present time. Solder remains firm and unchanged, with a fair amount of trading in progress. The present range of prices is given herewith:

Lead pipe, lb.	$0 14	$....
Lead waste pipe, lb.	0 15	....
Lead traps and bends	Net list.	
Lead wool, lb.	0 16	
Lead sheets, 3 to 3½ lbs. sq. ft., lb.	0 13¼	
Lead sheets, 4 to 8 lbs. sq. ft.	0 12½	
Cut sheets, ¾c lb. extra, and cut sheets to size, 1c. lb. extra.		
Solder, guaranteed, lb.	0 66	0 70
Solder, strictly, lb.	0 60	0 66½
Solder, commercial, lb.	0 55	0 62
Solder, wiping, lb.	0 54½	0 56
Solder, wire, lb.	0 65	0 70

WROUGHT IRON PIPE

Effective Feb. 26, 1918

Standard Buttweld—	Per 100 feet Black	Galvanized
⅛ in.	$ 6 00	$ 8 00
¼ in.	5 16	7 29
⅜ in.	5 16	7 29
½ in.	6 55	8 12
¾ in.	8 28	10 41
1 in.	12 24	15 39
1¼ in.	16 56	20 82
1½ in.	19 80	24 89
2 in.	26 64	33 49
2½ in.	42 71	53 53
3 in.	55 85	70 00
3½ in.	70 84	87 76
4 in.	83 93	104 10
Standard Lapweld—		
2 in.	29 60	36 08
2½ in.	44 46	54 70
3 in.	58 14	71 53
3½ in.	72 68	90 62
4 in.	86 11	107 37
4½ in.	97 79	122 56
5 in.	114 00	142 82
6 in.	147 80	185 28
7 in.	192 80	241 57
8 L in.	202 50	253 75
8 in.	233 30	292 32
9 in.	279 50	350 18
10 L in.	259 20	324 80
10 in.	333 70	418 18

Terms 2% 30 days, approved credit.
Prices—Ontario, Quebec and Maritime Provinces.

Old Materials Stagnant; Improvement Looked For

OLD MATERIALS.—Business can be termed stagnant. There are no elements of interest attached to the market here, and trading is at a very low point. Dealers seem to feel that improvement must come, though when it is not possible to determine. Prices are unchanged.

Tea lead	$0 04½	$....
Heavy lead pipe	0 07	0 07½
Yellow brass	0 12	0 13
Red brass	....	0 21
Light brass	....	0 09½
Heavy zinc	0 05½	0 06
Heavy copper	0 21½	0 22
Stove plate, per ton	17 00	18 00
Old cast iron, per ton	25 00	26 00
Zinc sheets, per lb.	0 26	....

Little Spot Tin Offering; Lead and Spelter Advance

INGOT METALS.—Little spot tin is now offering, but some is arriving, though the actual date of arrival is as yet uncertain, depending as it must on shipping. Spot stocks still hold at a high price level, with some easing off shown for supplies to come. Prices on lead and spelter both show an upward tendency during the week, though this is not due to heavy demand. Primary points report a very good trade and markets show strength.

COPPER.—Reports from United States points indicate a heavy consuming demand, but producers are equal to this, and no shortage is reported. Conditions locally are unchanged, the price holding firm around 29-30c per pound.

TIN.—Little of interest has developed since last issue on this market. Supplies are looked for at almost any time, orders being accepted on tin to arrive at $1 to $1.15 per pound, while spot offerings still range around $1.35 to $1.50.

SPELTER.—The market is somewhat firmer. A fairly steady demand, with a gradual depletion of stocks owing to certain producers withdrawing from the market, are factors. Prices locally range from ¼c to ½c higher at 9¼c to 9½c per pound.

LEAD.—Consumption at United States points and for Allied account is considered heavy and the market shows increasing strength. This has been reflected locally in an advance of ¼c to ½c, and whereas 9¾c is named in some quarters, most sellers are asking 10c per pound. Domestic requirements are not absorbing a heavy amount of this metal, though some trading is reported.

ALUMINUM.—There is no change to record in the situation during the week. Government requirements continue to absorb the bulk of this metal. Price locally holds firm at around 50c per pound.

ANTIMONY.—This market has shown some strength under an increased demand. Primary points report a somewhat quieter tone. Locally the price is unchanged at 16c per pound.

PIG IRON.—There is little to be said in regard to pig iron. The demand is far in excess of supply and commercial requirements are receiving comparatively little attention. Reports from United States points indicate increased production, but the demand has not yet been overtaken.

WILL UTILIZE MACHINERY MORE AFTER THE WAR

Lord Leverhulme, addressing a reconstruction meeting some time ago at Cardiff, Wales, on a six hours' working day, said that for years after the war we should have production of goods at 50 per cent. above pre-war rates, and be faced with the competition of countries which had profited by the war and had no war debts. The question was one of men versus machinery. Two shifts would give a maximum production at a minimum cost. They would get it out of machinery instead of out of the workers, who would get increased wages, shorter hours and more leisure for education and physical training.

CLEANLINESS AND SANITATION ARE SYNONYMOUS

YONGE ST. and WEST

K. B. ALLISON
668 Yonge St.
Telephone North 667

BELYEA BROS.
1002 Bathurst St.
Telephone Hillcrest 2054

W. J. HALL
6 Marlboro Ave.
Telephone North 7637

W. G. KARL
344 Davenport Rd.
Telephone Hillcrest 2404

T. B. SMITH
182 Avenue Rd.
Telephone Hillcrest 3296

HEARN & LILLIE
311 Roncesvalles Ave.
Telephone Parkdale 3984

R. PATERSON
907 Keele St.
Telephone Junction 430

LOCKE BROS.
282 Dupont St.
Telephone Hillcrest 4389

L. LeGROW
92 Harbord St.
Telephone College 5050

FRED WILES
290 Davenport Rd.
Telephone Hillcrest 883

A. E. MELHUISH
1174 College St.
Telephone Parkdale 2120

The prudent housekeeper systematically and continually is cleaning the sleeping and living portions of the home because she knows that cleanliness is conducive to BETTER and HEALTHIER LIVING but this represents superficial cleanliness inasmuch as it is "on the surface" so to speak and its satisfactory adoption means diligent physical energy properly applied.

But what of SANITATION as represented in the PLUMBING equipment of your Home?

Sanitary Plumbing does not mean so much whether the taps are leaky or not, or whether the bath and sink are white and clean in themselves, as it does that the waste and vent pipes which are below the floors and behind the walls are sound, because the waste and vent pipes that leak — must leak SEWER GAS—disease-carrying gas—into your home 24 hours every day of the year to be inhaled by you and your family.

IS IT WISE—IF THESE CONDITIONS DO EXIST—TO BE INDIFFERENT TO THEM?

—OR—

IS IT BETTER TO HAVE HEALTH INSURANCE FOR YOU AND YOUR FAMILY BY CONSULTING YOUR PLUMBER?

YONGE ST. and EAST

J. W. ORAM
809 Yonge St.
Telephone North 436

GEO. H. COOPER
131 Church St.
Telephone Main 2137

BENNETT & WRIGHT
72 Queen St. E.
Telephone Main 3820

HARRY HICKS CO.
203 Church St.
Telephone Main 2069

ACME PLUMBING CO.
291 Broadview Ave.
Telephone Gerrard 3907

A. F. PASSMORE
1 Carlton St.
Telephone Main 5162

JNO. WRIGHT
425 Church St.
Telephone North 206

HARRY FARTHING
171 Leslie St.
Telephone Gerrard 427

FIDDES & HOGARTH
122 King St. E.
Telephone Main 4417

TORONTO FURNACE & CREMATORY CO.
111 King St. E.
Telephone Main 1907

H. J. HILLIER
2199 Queen St. E.
Telephone Beach 202

CONSULT ANY OF THE ABOVE FIRMS AS RELIABLE SANITARIANS

This suggestion of an advertisement was submitted to the committee by K. B. Allison, Toronto. It is intended to use a series of such advertisements in the Toronto daily papers in connection with a general publicity campaign on the co-operaive plan.



GOSSIP OF THE TRADE

MASTER PLUMBER APPOINTED VICE-PRESIDENT MONTREAL A. A. A.

At the recent election of officers for the ensuing year W. R. J. Hughes, head of the firm of J. W. Hughes and Son plumbers and steamfitters, was elected to the office of vice-president of the Montreal Amateur Athletic Association.

Interviewed by SANITARY ENGINEER recently, Mr. Hughes expressed himself as always interested in clean sport. For a great many years he has associated himself in various ways with such movements as appealed to him for the promotion of good wholesome sprt

"To meet a man at play and to come in contact thus with others is a great developer of oneself," said Mr. Hughes. "It develops one's patience and is one of the best ways that I know of helping one to know the other fellow. For a man on the ball field or engaged in other good sport will be himself truly. I think one knows better how to handle men if he meets them in this way."

The popularity of Mr. Hughes is attested as above by his election to the board in this signal manner. He has for the past two years been a director of the same association.

MUST INSTAL SANITARY EQUIPMENT IN GANANOQUE

The town council of Gananoque recently passed a by-law that: "From and after the first day of October, 1919, it shall not be lawful for any owner, lessee, or occupant of any property in the town of Gananoque upon any street upon which is established the municipal system of sewerage, to keep or maintain any outside watercloset, privy, or privy vault, which is not connected with the sewerage system of the Town of Gananoque under the regulations and subject to the approval of the sanitary inspector. Any person offending against any of the provisions of this by-law shall be liable to the penalty imposed by the general by-law of the Town of Gananoque, imposing fines and penalties for the breach of the by-law."

NEW PARTNERSHIP ESTABLISHED

Starting life in the plumbing game some 15 or 16 years ago, Bill Cunningham has without doubt forged ahead Everybody calls him "Bill," but somehow or other it sounds better to attach a handle to our friend's name and call him "Mr." However, W. H. Cunningham it will be recalled, started in business over a year ago as manufacturers' agent, and



W. R. J. HUGHES
Vice-President Montreal Amateur Athletic Association

his success has been such that he has had to call in W. F. Hill to assist him in handling the work. The team W. H. and W. F. now operate under the firm name of W. H. Cunningham & Co., office address, 183 Church street, Toronto.



W. F. HILL
Of W. H. Cummingham & Co., Toronto.

W. F. Hill needs very little in the way of an introduction to the trade because of the fact that he has been calling upon the sanitary and heating profession for upwards of eight years, representing during that time the Good Mfg. Co.

The new company will still handle the same lines as heretofore, and have recently been appointed representatives in Toronto and eastern territory for the Galt Brass Co., Ltd., manufacturers of Perfector brass goods and Vitro tanks.

The trade no doubt will joint THE SANITARY ENGINEER in wishing the new concern every success in their endeavors.

CAPT. LEN. S. MORRISON RELEASED

Every member of the craft will be glad to learn that one of the sons of James Morrison, the brass goods manufacturer, Toronto, was released recently and is now in London, England.

Capt. Len. Morrison went overseas with the first contingent and has seen some very severe fighting. He was badly wounded in the battle of St. Julien, in 1915, and taken prisoner. He had a pretty tough time in the various prisons, being moved from one to another, but finally was moved to Switzerland, where he has been for quite a while. Several efforts were made to procure his release but all to no avail, until just recently his family learnt that he was in London. There is no news as yet as to whether he will return home. "Len." is only one of a number of the family of Morrisons who are doing their bit, as is indicated by the accompanying group of photos. Jas. Morrison Sr. has just recovered from a spell of sickness, he has both sons and grandsons overseas, and quite a large number of their staff, too, are at the front.

SANITARY ENGINEER joins the friends of the family in wishing a safe return of all the "boys," knowing full well that they have only been doing their part in another capacity in trying to make this good old world a better place to live in.

A CHAT ABOUT COAL SAVING

(Continued from page 14.)

tions (except that temperature of heating medium would be 180° at boiler and loss per square foot of radiation 150 B.t.u. instead of 240 B.t.u.) the coal burned would be as

$$\frac{150}{240}$$

or 62½ per cent. of 3.15—1.97 tons per hundred feet of radiation per season.

By the above method an approximation may be arrived at for any month if the average or normal temperature for that

month be obtained from weather bureau.

In the same way the amount of soft coal used may be approximated by using 5,800 instead of 8,000—(formula 2). But where Ideal Down Draft Boilers are used with free burning soft coal as fuel then 7,200 may be used instead of 8,000 (formula 2).

Example: Approximately how much fuel —free burning soft coal—would it require in an installation containing 3,000 cubic feet steam direct radiation exclusive of piping? Radiation figured to be ample to maintain a temperature of 70° inside with weather outside 20° below zero—steam at boiler 219°—job located in Chicago—where the average of mean temperature during the 7 heating months is 36° (weather bureau records 33 years). Boiler: Ideal Down Draft, having proper conditions of installation and attention.

$$\frac{3{,}000 \times 1.25 \times 240 \times 24 \times 210 \times (70-36)}{7{,}200 \times 2{,}000 \times (70-20)} = 119 \text{ tons per season.}$$

or 3.96 tons per 100 feet of radiation.

It will of course be appreciated that the above method should not be taken as giving the exact figures as to how much coal should be used but can only be considered an approximation because based on average instead of exact conditions.

TWO SPLENDID NEW BOOKS

It is not very often that one has the pleasure of reading a book or books on business management, without having first to have one's mind tuned up to a pitch which will endure the wading through a lot of "dry stuff." But such is not the case with two books recently published by A. W. Shaw Co., Chicago, entitled "Managing a Business in War Time." These two books contain articles written by some of the biggest business men in the world. Men, too, who have in many cases graduated at the school of practical experience. One of the articles which appears in Volume One was published in SANITARY ENGINEER October 1st, 1917, by the courtesy of the A. W. Shaw Co., and written by Hon. John Hodge, M.P., Minister of Labor. The following list of subjects and authors will give our readers an idea of what is in store for them if they acquire these two books.

Lord Leverhulme contributes an article entitled "What American Business Men Can Learn From British Experience." Sir Charles W. Macara, Bart., writes on "How America Can Meet War-Time Business Conditions." Other able writers have contributed articles bearing the titles of:

The Problem of Man-power in War Time.

Running a Store in War Time.

Hints on Handling War-Time Business.

How England Met Six Important War-time Business Problems.

Training the Boy Worker.

Motor Trucks: A War-time Ally.

South American Trade Knocks at the Door.

In all there are 36 complete articles by almost as many authors.

Further particulars may be procured by writing the publishers above named.

Nanaimo, B.C.—Sewer construction to cost $832 will be undertaken shortly.

WINNIPEG PLUMBING DIVISION

Permits issued

133

Inspections

Water Tests	Smoke Tests	Subsequent Inspections	Miscellaneous Inspections	Defects Rectified
64	110	292	12	167

Sewer Division

Permits issued	Connections constructed	Inspections
16	18	48

Sewer Flushing

Tank Flushings Gallons	Hose Flushings Gallons	Total Gallons of Water
969,216	453,750	1,422,966

The above table shows the work accomplished by the Winnipeg Plumbing and Sewer Inspection Department during the month of May—a public service that cannot but be of inestimable value to the citizens of Winnipeg.

Current Events in Photograph



WOMEN FORESTERS OF ENGLAND

Of all the occupations forestry has generally been regarded as one of the most strenuous, one that required the greatest amount of strength and stamina. In England women have taken up the work. The photo shows the forestry corps of the women's land army are now working at Heathfield, Sussex, tree felling and wood cutting for the supply of telegraph poles and trench supports for Government and army uses.



Sergt. Jas. Anderson



Capt. Len. S. Morrison.



Corpl. James Young



Corpl. O.C. Roche



Lieut. Donald W. Morrison.



Pte. Wm. Plummer



Pte. Alfred Nutall



Pte. Bert. C. Morrison



Pte. Charles E. Thomas



Pte. C. L. Royle

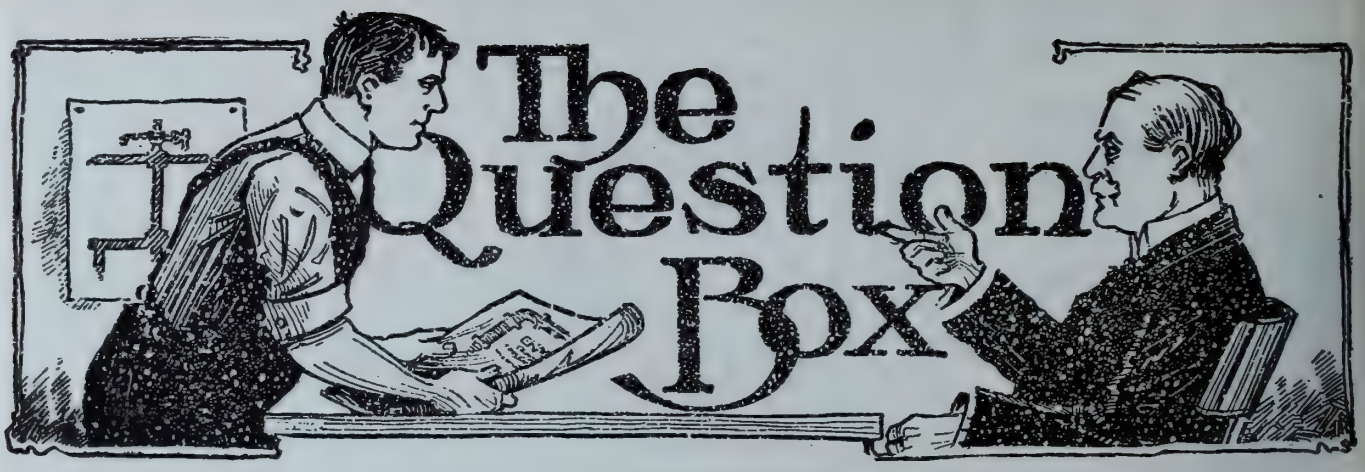
Honor Roll

The James Morrison
Brass Manufacturing Co Ltd.
Toronto



Pte. Albert Black

C. J. Adams. S. Cooper.
C. Gillard. A. W. Howell. C. Mitchell. R. H. McPherson.
O. G. Plewis. Harry Leonard. W. J. Plummer. J. C. Needham.



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

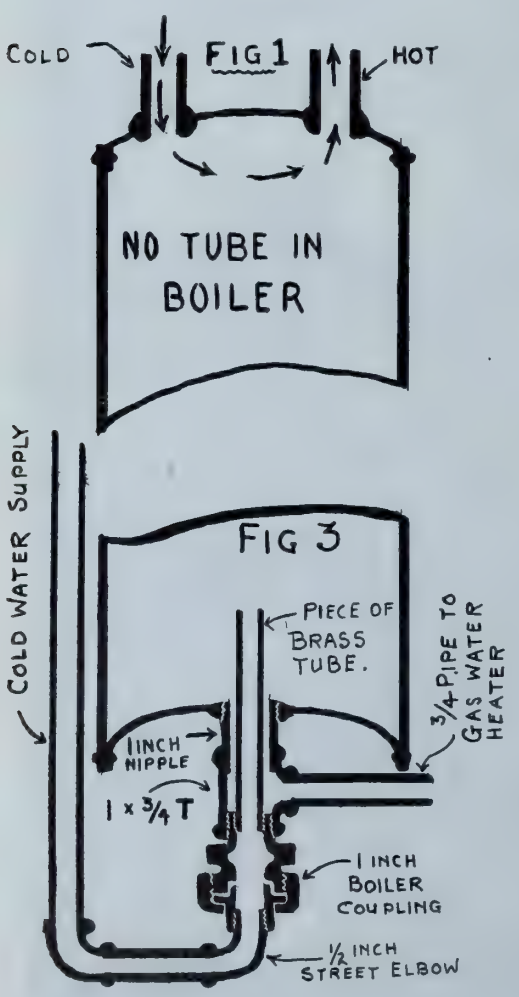
HOW CAN NEW TUBE BE PUT IN RANGE BOILER?

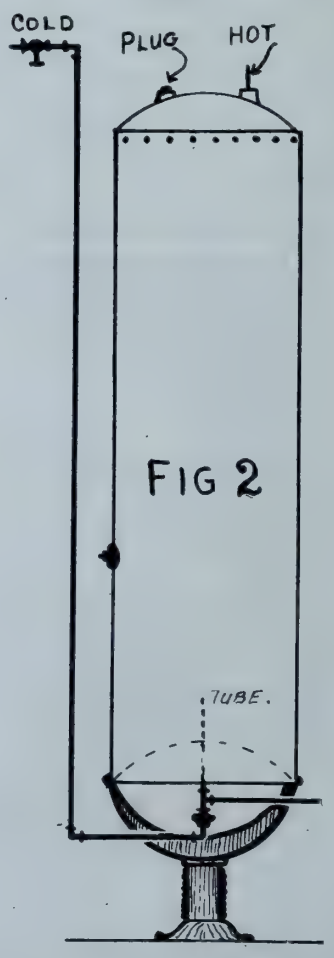
Editor, SANITARY ENGINEER.—A few days ago I was called in to see a range boiler and gas water heater that did not seem to work right. The customer complained that no matter how much hot water there was in the boiler they could not get more than about a pailful of hot water out. I found the boiler was connected to the furnace, as well as to a gas water heater, and also learned that when the gas water heater was burning that more hot water was gotten out than when no gas water heater was burning. I disconnected the boiler couplings at the top of the boiler and found that the tube on the supply pipe from the city water main was broken off, and as there is no room between the basement ceiling and the top of the boiler, and there is quite a lot of work in connection with taking down the boiler, I wish to be informed if there is any way out of the difficulty. Can a tube be gotten in without taking the boiler down?

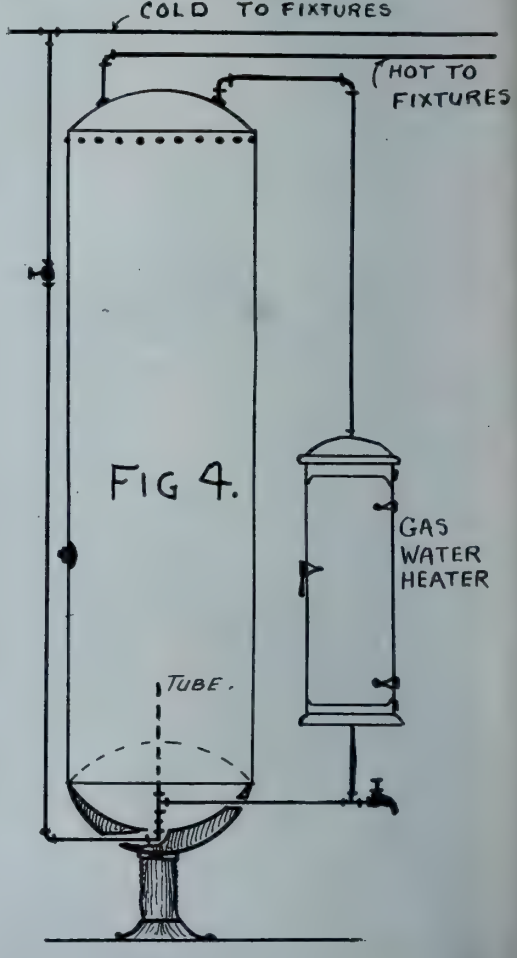
Sask. R. B. T.

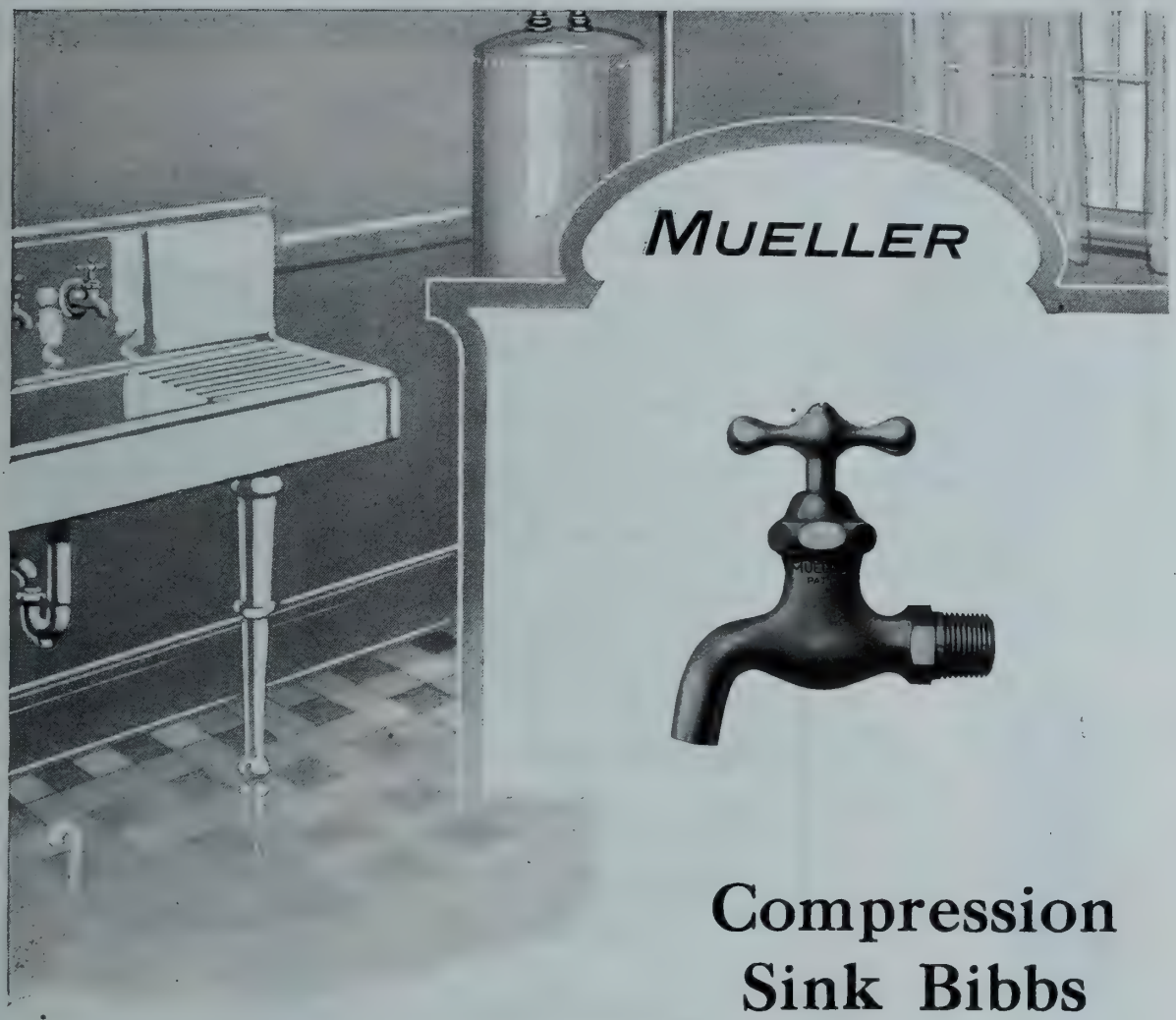
No doubt the reason that very little hot water could be procured was because of the tube in the boiler being broken, and as soon as the small amount of hot water in the top of the boiler was drawn off the cold water would become mixed, and hold the hot water down, short circuiting, as shown in Fig. 1.

Of course, there are several ways by which this trouble can be overcome. First, by using a brass boiler coupling on the cold water supply and soldering a lead tube to same. This can be bent to go into the boiler. But there is still another method that can be adopted. There









Compression Sink Bibbs

SIMPLE elegance, combined with superior strength and wearing quality, is what you give your customer when you install **MUELLER** goods.

The many advantageous features of **MUELLER** compression bibbs give maximum service from the bibb as a whole. The anti-spreading device that breaks up the whirling motion of the water and the corrugated stem and handle, allowing the handle to be set at any angle without becoming loose or wobbly, are only two of these features.

MUELLER Bibbs are the best the market affords. Write for prices.

H. Mueller Mfg. Co., Limited

SARNIA CANADA

MUELLER

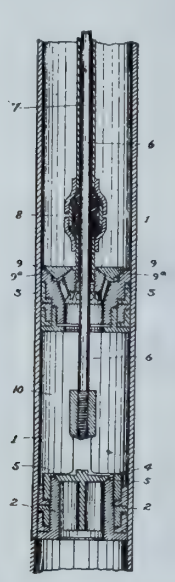
is no reason why the cold water tube should be used at all in this case. Simply take the boiler coupling on the cold side out and plug the opening. Then run a piece of half-inch pipe to the bottom of the boiler on the outside, as shown in Fig. 2, using a regular boiler coupling in the manner described. This connection, we believe, is somewhat novel, but is all that is necessary. It has been adopted several times by the writer and no trouble resulted.—Editor.

NEW CANADIAN PATENTS

(Continued from page 23.)

tubular rod attached to the upper piston, a packing gland on the rod intermediate of the length thereof and a rod attached to the lower piston slidably operating within the tubular rod, as and for the purpose specified.

2. In a deep bored well pump having a plurality of independently operated valvular piston, o packing gland comprising two reducing sockets secured together at their largest diameters, a hollow operating rod secured to the upper end of said gland, and a tubular connection between said gland and the piston as described.



No. 182,004. Pump.

3. In a deep bored well pump having a plurality of independently operated valvular pistons, an upper piston, a packing gland secured thereto by a tubular connection, a hollow operating rod secured to said gland, a lower piston the operating rod of which passes through the upper piston, the tabular connection thereto, the packing gland and the lower portion of the hollow operating rod, said lower piston emerging from and running parallel to the hollow upper piston rod as described.

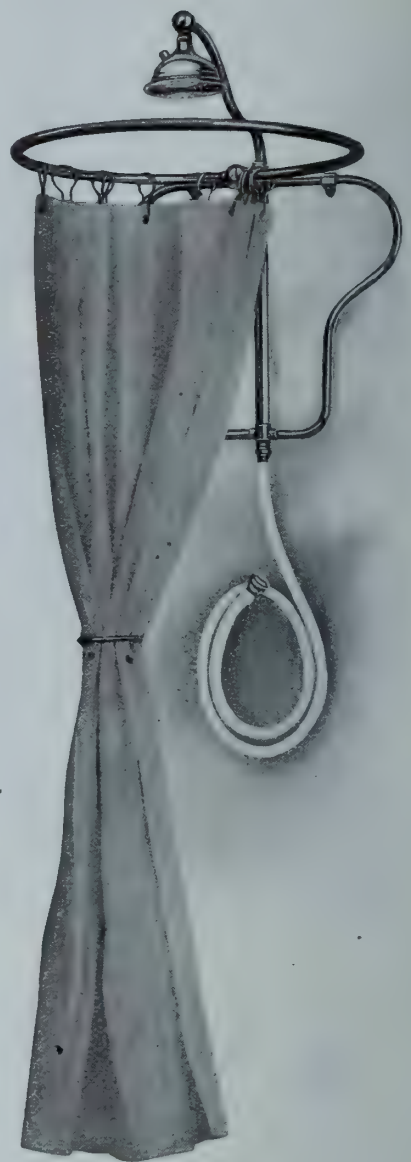
4. In a deep bored well pump having a plurality of independently operated valvular pistons, an upper piston, a packing gland comprising two reducing sockets secured together at their largest diameter, secured to said upper piston, a tubular connection between said socket and said upper piston, a hollow operating rod connected to said packing gland, a lower piston the operating rod of which passes through the upper piston, the tubular connection thereto, the packing gland, and the lower portion of the hollow operating rod, said lower piston rod emerging from and running parallel to the hollow upper piston rod, as described.

Showers Wolverine Showers

Have a Perfection Portable Shower on display and be ready to serve your trade during the hot summer months.

This is No. 2460, complete with Bath Cock Connection, White Duck Curtain and Wall Clips for fastening.

Other styles listed in Catalog 'C'



Canadian Wolverine Co., Ltd.

Chatham - Ontario

IT IS stated that the firm of Franz Schilling & Sohn, bell founders to the Court, at Apolda, Hanover, have melted down some 70,000 church bells during the war, the metal of which has been used for military purposes. The famous Kaiserglocke from the Cologne cathedral, cast from cannon taken from the French during the Franco-German war of 1870-71, will, it is further said, also be removed for the same purpose. Lightning conductors, rumor also states, are being also pulled down from the churches, and their metal used for army requirements.

Montreal. — Durand & Desrosiers, plumbers, have dissolved partnership.

PIPE THREADING MACHINES, LATHE PATtern, cutting up to 6". Give particulars and lowest cash price. Partridge & Halliday, 174 Lombard St., Winnipeg, Man.

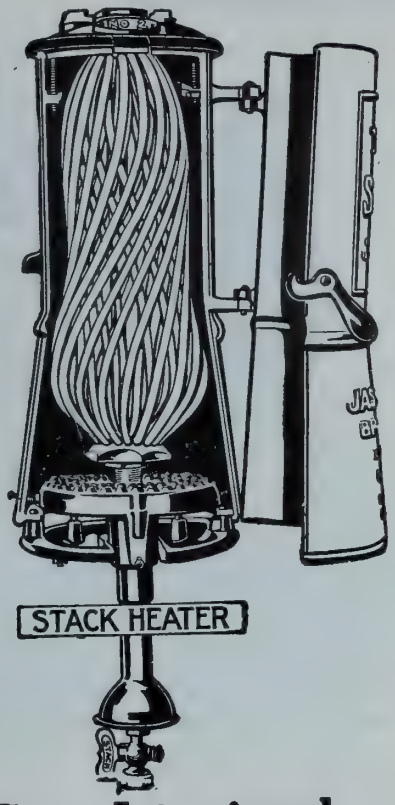
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The STACK will heat 5 gallons of water 3 minutes quicker than the average heater.

The STACK raises the temperature of 5 gallons of water 28 degrees higher in 10 minutes than the average heater.

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The STACK shows 15% greater efficiency than the average heater.



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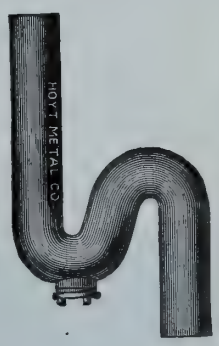
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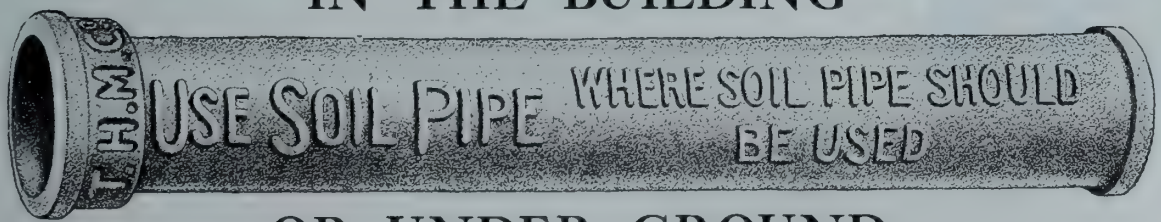


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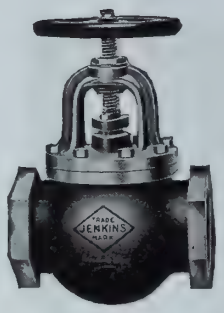


FIG. 141
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Standard Pattern Iron Body Globe Valve Screwed with Yoke.

This Valve Sells Best
Because—

Since 1864 Jenkins Bros. Valves have acquired a wide reputation for quality and trustworthy service in holding steam, oils, acids, water and other fluids in places where other valves do not "make good."

If a genuine Jenkins Bros. Valve does not keep perfectly tight in a bad spot where other valves cannot be kept tight you may return it and we will promptly refund your money. Stocks at all dealers.

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It is Evidence Like This



"Toledo" Geared Adjustable Threading Tool No. 2 making a cut and thread on a 4-inch bend in position. It was desired to install a steam separator above throttle of engine, and the whole job was satisfactorily completed without removing the pipe line.

which proves the extra value of "Jardine" and "Toledo" Pipe Threading Tools

"Jardine" and "Toledo" Pipe-Threading Tools cut clean, sharp threads with a minimum of muscular effort. They permit of one man doing work which ordinarily requires two. But even more important than this, they will work in any odd corner. Instance the job illustrated in the accompanying engraving. Here is a case where, with an ordinary tool, the whole pipe line would have had to be taken down. The tool paid for itself on that one job.

Investigate "Jardine" and "Toledo" Tools yourself. Ask us to send names of users in your locality. Then go and talk to these men in your own business and learn what they think of these good tools.

A. B. JARDINE & CO., Limited, Hespeler, Ont.

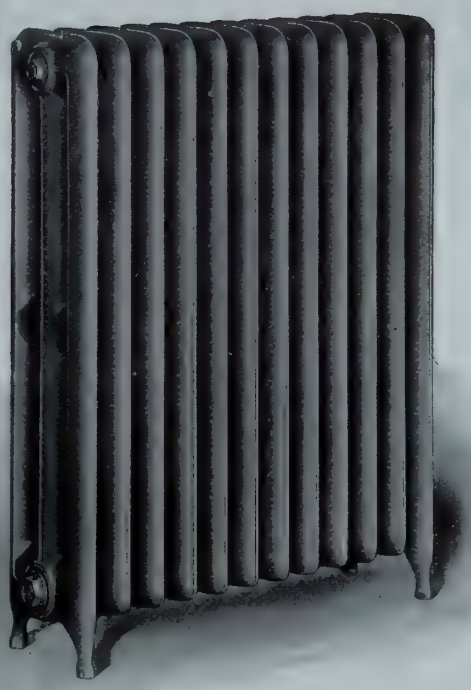
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Show your prospect that purchase price means nothing if radiators cannot be run *at minimum fuel cost.*

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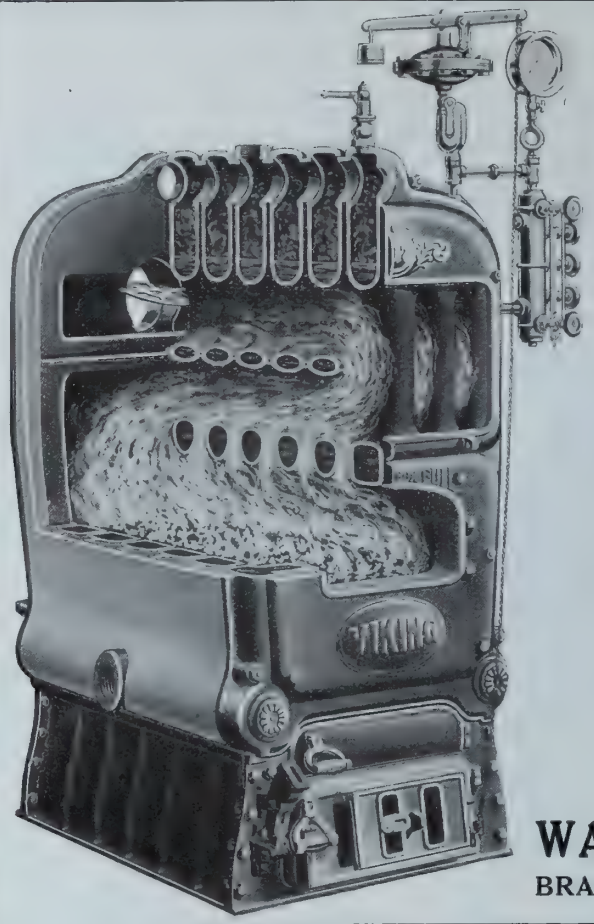
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are giving great satisfaction in all parts of the Dominion.

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WHY LEAVE IT BEHIND?

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WITH FLAT-LINK OR CABLE CHAIN

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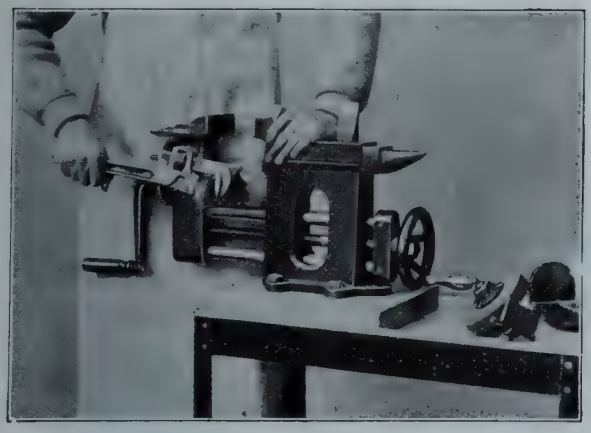
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An Equipment All in One



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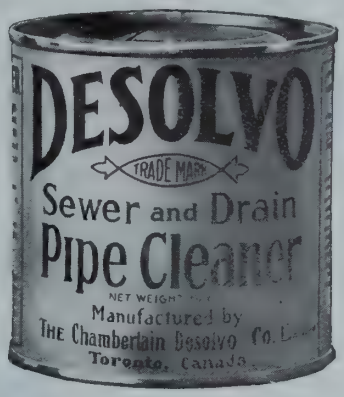
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It's not a toy. It's a real combination of practical tools for practical people.

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Gets Hot with Cold Water Try it!

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We modestly claim that DESOLVO does all you expect it to do—and more.

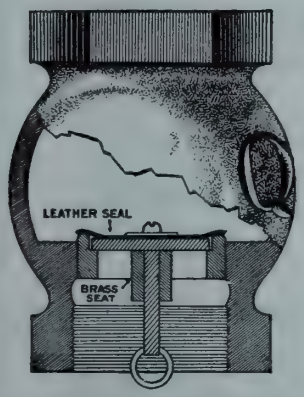
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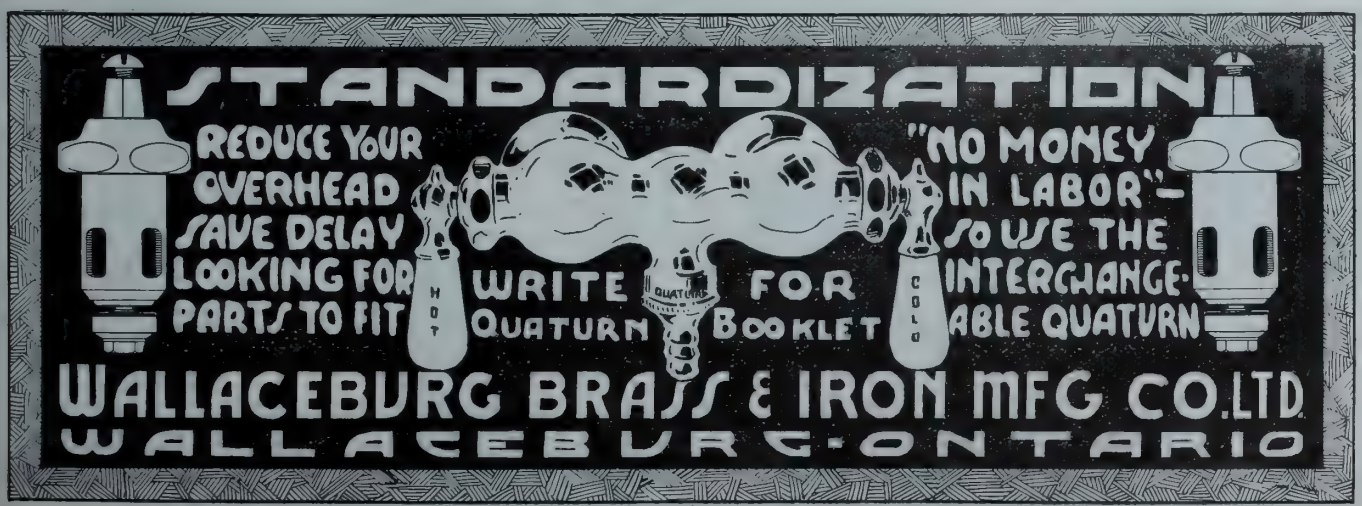


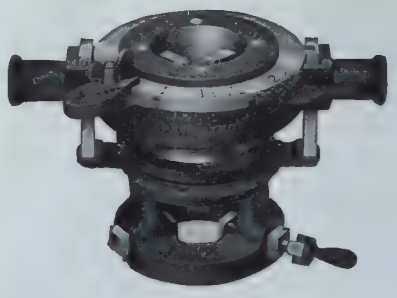
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A foot valve that just can't leak is one of the most important parts in a pumping equipment. Every person with any pumping experience will tell you that if the foot valve will not hold, the strain on the pump is doubly increased. In fact 50 per cent. of the efficiency of the pump depends upon the foot valve.

See that you procure a "Q" valve for every pumping outfit you install and priming troubles will be a thing of the past.

R. MACDOUGALL CO., LIMITED
GALT CANADA





PIPE THREADING AND CUTTING TOOLS

One Man Can Thread up to 12 Inch.

You cannot afford to expect your men to make horses of themselves. If they did they could not keep it up. Our tools save time, do better work and makes life worth living for your men.



Cuts Without Burring

No. 1 cuts from ⅛" to 1"
No. 5 cuts from ½" to 2"
No. 10 cuts from 2½" to 4"
No. 15 cuts from 4" to 6"

Ratchet	Geared
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No. 25—1" to 2".	No. 61—2½" to 6".
No. 26—1" to 2".	No. 80—4½" to 8".
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TORONTO, CANADA

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Our No. 15 style narrow flange designed for the Canadian trade.

One of many styles

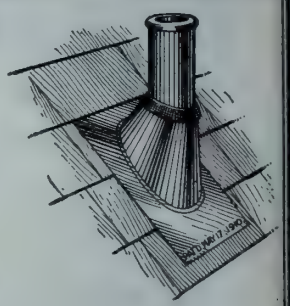


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Handsomely nickel-plated or plain
Sizes ½ to 2"

Stock now carried by our Canadian Representative
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THE BEATON & CORBIN MFG. COMPANY
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The SIMPLEX
Adjustable
Roof Flange



Fits any roof from ½ pitch to flat—just slide it down the pipe and it will conform with the pitch of the roof.

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Made in all sizes—For sale by nearly every jobber
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Rogers Malacca Cleaning Rods

for cleaning boiler tubes, chimney flues, soot chambers and underground fitings—saves excavating. Fitted with Scraper, Brush, Screw and Plunger.

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Second-Hand Pipe

1-2" to 4"

Black and Galvanized

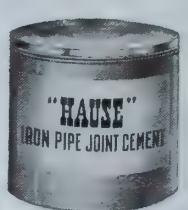
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Consumers Metal Company, Limited
14 St. John Street MONTREAL
Works: LACHINE, QUE.

"HAUSE" PIPE JOINT CEMENT

For steam, water, air, oil, gas, gaskets, etc. The cement that cements. Sets like gum. Allows no leaks.

The Great Value of "HAUSE PIPE JOINT CEMENT" lies in its peculiar chemical properties which permits of its hardening and expanding after the joints are made up. In making up joints it has the same effect as a lubricant on the best graphite, and while the joints may be made and broken readily, a perfectly tight joint is maintained at all times. Comes in 1-lb., 5-lb., 15-lb., 25-lb., 50-lb. cans, 100-lb. barrels. Manufactured in ready mixed and powder form. Ask your jobber for prices, or write us direct.



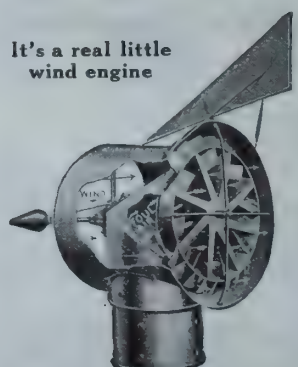
Manufactured in Ready Mixed and Powder Form.

Made in Omaha, Neb., U.S.A., by

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THE BICALKY

It's a real little wind engine



VENTILATOR

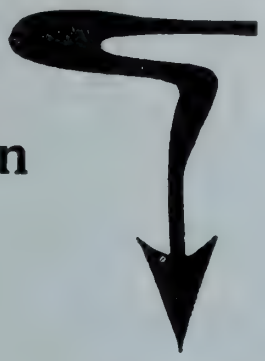
Is a positive suction fan that ventilates

The "Bicalky" will dispense with all auxiliary heaters on local ventilation systems.

It is, as far as we know, the most scientifically constructed, self-propelled fan ventilator on the market.

Write us for full particulars.

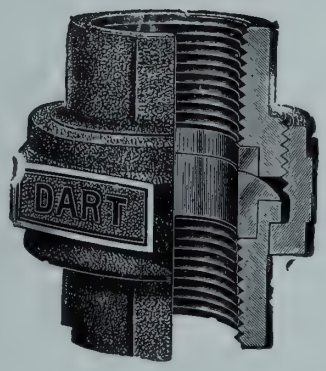
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Easy Connection Regardless of Alignment

Because of length of service rendered and their easy connection regardless of alignment, Dart Unions afford the purchaser a decided saving in money and time.



Dart Unions are "Bronze to Bronze" at the joint—rust-resisting insurance against pipe troubles.

Ask your jobber for them.

MADE IN CANADA.

DART UNION COMPANY, LIMITED

TORONTO - CANADA

There Are Lots of Gate Valves

Advertised and Sold



but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.
Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.
Approved by the Fire Underwriters' Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario

EVERY FITTING TESTED

"VitrO" NO-TROUBLE Tanks are guaranteed to stay tight



Why buy copper lined tanks when you can buy "VitrO", the tank without a lining?

"VitrO" NO-TROUBLE tanks materially help to maintain your reputation of giving best service and satisfaction to your customers.

They're guaranteed to give permanent satisfaction—because they're all in one piece and never need repairing.

EVERY TANK GUARANTEED

GALT BRASS COMPANY
Limited
GALT - - ONTARIO

SEE IMPORTANT ANNOUNCEMENT ON PAGE 19

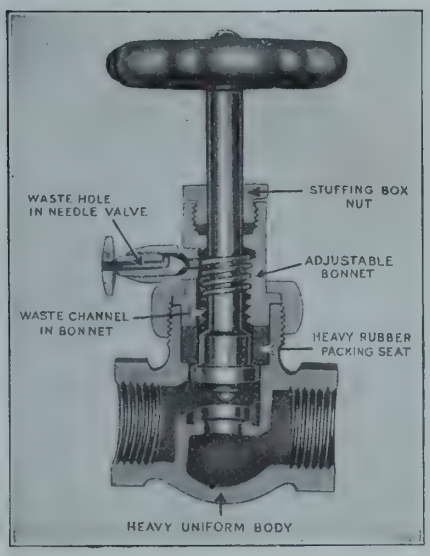
SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

Vol. XII. Publication Office, Toronto, July 15, 1918 No. 14

Take A Good Look At This

When you intend buying anything which is to play an important part in your business you generally look well into the proposition and get right on the inside of things. Take a look at this line of goods; it's right in every detail.



Here's the inside view of our new and improved stop and waste cock. We don't ask any of our customers to buy anything on speculation. Take a look at this illustration. You can see the whole works at sight.

The installation of "Empire" Products is the one sure way of quickly gaining a reputation for quality work. Every job that you put in with "Empire" goods means the adding of friends to your business list.

Extend your connection and at the same time get your due profit by installing "Empire" Goods.

Empire Manufacturing Company, Limited

London Toronto

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While



A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for BEAVER BRAND CAST IRON ENAMEL WARE

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

ONTARIO:
Monarch Brass Mfg. Co., 71 Brown St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes, 120 Lombard St., Winnipeg

CANADIAN CONSOLIDATED RUBBER CO., LIMITED
DOMINION
RUBBER SYSTEM
AND ASSOCIATED COMPANIES

This symbol, on any rubber product, is a warranty for quality and service. Behind it is an organization that nas been manufacturing rubber goods for more than half a century. It is a guarantee that the product will stand up under the most trying conditions and that its service is easily the best to be had.

The best way to prove our statement is to put our products to the test. One of our service branches is within your reach. Get in touch with that branch and find out for yourself how well we can serve you and those you wish to serve.

Everything in Rubber,
"Made in Canada."

Canadian Consolidated Rubber Co.
Limited
HEAD OFFICE - MONTREAL

Branches at Halifax, St. John, Quebec, Ottawa, Toronto, Hamilton, Kitchener, London, North Bay, Fort William, Winnipeg, Brandon, Regina, Saskatoon, Calgary, Lethbridge, Edmonton, Vancouver and Victoria.

WOLVERINE
Asbestos Rubber Bibb Washers

The Flexible kind that make up on worn seats

9 Sizes 9



"C" Catalog "C"

Made from the Highest Grade Material obtainable

Canadian Wolverine Company, Limited
CHATHAM, ONTARIO

PIPE THREADING TOOLS
It is Evidence Like This



"Toledo" Geared Adjustable Threading Tool No. 2 making a cut and thread on a 4-inch bend in position. It was desired to install a steam separator above throttle of engine, and the whole job was satisfactorily completed without removing the pipe line.

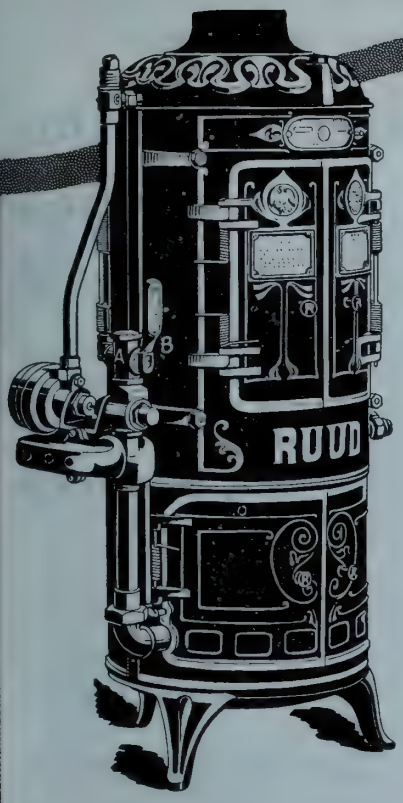
which proves the extra value of "Jardine" and "Toledo" Pipe Threading Tools

"Jardine" and "Toledo" Pipe-Threading Tools cut clean, sharp threads with a minimum of muscular effort. They permit of one man doing work which ordinarily requires two. But even more important than this, they will work in any odd corner. Instance the job illustrated in the accompanying engraving. Here is a case where, with an ordinary tool, the whole pipe line would have had to be taken down. The tool paid for itself on that one job.

Investigate "Jardine" and "Toledo" Tools yourself. Ask us to send names of users in your locality. Then go and talk to these men in your own business and learn what they think of these good tools.

A. B. JARDINE & CO., Limited, Hespeler, Ont.

Sole makers of "Jardine" Pipe-Threading Tools.
Sole licensees to manufacture and sell Toledo Pipe-Threading Tools in Canada.
Agents, Winnipeg and West—Stanley Brock, Ltd., Winnipeg, Man.
Brockville and East—J. R. Devereux, 358 Beaver Hall Square. Montreal.
Belleville and West—W. H. Cunningham, 183 Church St., Toronto, Ont.



A Live Story for Every Live Plumber

THERE'S a strong live spirit of make-good injected into every motion of Ruud production. Back of that is the basic idea of quality. It is this quality, created in the very beginning of the Ruud business and maintained for twenty years, that has built up the biggest Water Heater business in America. And we believe, with *pride*, that the Ruud line is the *best* in the world.

This is the time for you to start building a big and permanent Water Heater business. Here is a real merchandising and selling opportunity. During 1918 or until the return of peace and normal building conditions, you can realize a clear profit and create a permanent good will by selling and installing Ruud Water Heaters. You'll find that you'll be very unwilling to relinquish this good business proposition when the war is ended and you have established yourself as a *Merchant*-Plumber as well as a *Master*-Plumber.

Ruud Instantaneous Automatic Water Heaters,
Ruud Multi-Coil Storage Systems,
Ruud Tank Water Heaters,
Ruud Automatic Shower Valves,
Ruud Garbage Incinerators.

The Ruud organization is the largest organization in America. Ruud service is available in any city where gas is available. The Ruud Line is the most comprehensive and complete. There's a type for every building, for every Water Heating purpose, for every purse. Ruud literature is the best printed—technically and educationally. It tells all you and your customers could want to know about the subject. Write today for our proposition.

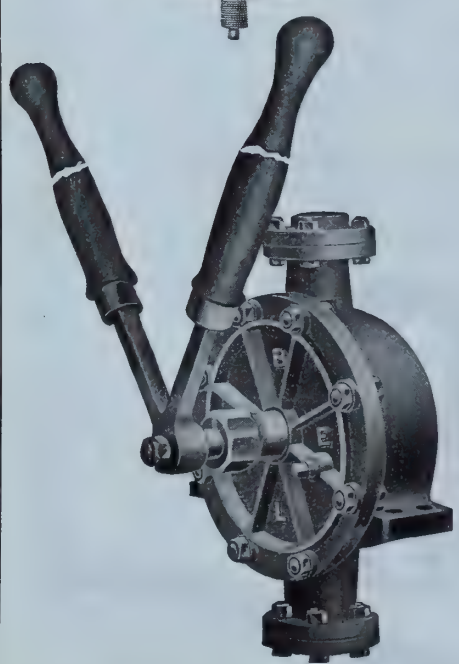
RUUD MANUFACTURING COMPANY
371-381 ADELAIDE STREET WEST
TORONTO, CANADA

RUUD
AUTOMATIC GAS WATER HEATER









FIVE WORKS—OVER 3,000 EMPLOYEES

It is our intention after the War to devote our energies to the intensive production of the following Specialities:

Gunmetal and Brass Valves and Cocks.
Steam, Water and Compressed Air Fittings generally.
Cast Iron Stop and Sluice Valves.
Semi-Rotary Pumps.
Extruded Brass and Bronze Bars.
Brass Bolts and Nuts, Studs and General Turned Work from the Bar
Cast and Malleable Iron Cocks and Pipe Fittings.
Pressure and Vacuum Gauges.
Injectors, Engine Governors.
Spraying Machinery.
Coppersmiths' Work.
"Stella" Brand Alloys, Manganese Copper, Silicon Copper, Ferro Zinc, Phosphor Copper and Tin, etc.

Business After the War

If you are interested in any or all of the lines mentioned and are in a position to take a hand in the energetic distribution of the same, please communicate with us NOW to our Head Office at the address below.

UNITED BRASSFOUNDERS and ENGINEERS, Limited

EMPRESS FOUNDRY

Cornbrook, Manchester, England

"Standard"
"Perfection" Built-In Baths

Made in One Piece Enamelled All Over



These Baths represent the last word in design and finish, and are made to build into Right or Left Hand Corner or into a Recess.

The "Perfection" Built-in Bath is only 17½ inches high, therefore convenient. It builds into walls and floors, the absence of all dust-collecting cracks and corners, meaning bathroom sanitation.

Made in 5 and 5½ foot sizes.

Illustrations on request.

Write the nearest dealer.

Standard Sanitary Mfg. Co.
Limited

General Office and Factory, Royce and Lansdowne Aves., Toronto, Ontario

Toronto Store:
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Winnipeg Showrooms:
76 Lombard Street

Hamilton Store:
20-28 Jackson Street West

Montreal:
4 Beaver Hall Square

Calgary:
31 Canada Life Building

Vancouver:
847 Beatty Street

"MADE IN CANADA"

THE CANADA METAL CO., LIMITED

HEAD OFFICE: FRASER AVENUE TORONTO

HAMILTON BRANCH
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301 CHAMBERS STREET



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Within the Charmed Circle of "Bigger Business" Products

You'll find Canada Metal Products wherever progress is a "by-word." With consumer and dealer alike, Canada Metal Products are within the charmed circle of Bigger Business Products.

EVERYTHING FOR THE PLUMBER

BATHS, LAVATORIES, SINKS, ARISTOCRAT LAUNDRY TUBS,
LEAD PIPE, SOLDER, BLOCK LEAD, SHEET LEAD, Etc.



Burnham Boilers

The stove in the little red school-house and the economical lesson it taught

DID you go to "the little red school-house on the hill?"

Well, then, you will remember how it was warmed with a "pot stove" set over in the northeast corner.

Also how the pipe used to go across that end of the room, down one side and part way across the other end, to the chimney.



Remember how you used to look at the wires that held it up and wonder what would happen if one of them broke or happened to "get cut," somehow?

Remember also how you used to figure out why they didn't run the pipe direct across the room from stove to chimney?

Of course, you and I now know that the more pipe there was running around the room, the more heat stayed in the room and the less went up the chimney.

In fact, that is the basis for fire travel in boilers.

It's why the Burnham Boiler has a **three times** back and forth, inside fire travel, on each side of the boiler.

The fact that the Burnham smoke-pipe is seldom too warm to hold your hand on, proves how little heat goes up chimney. Send for our Boiler Catalog.

Lord & Burnham Co. Limited of Canada

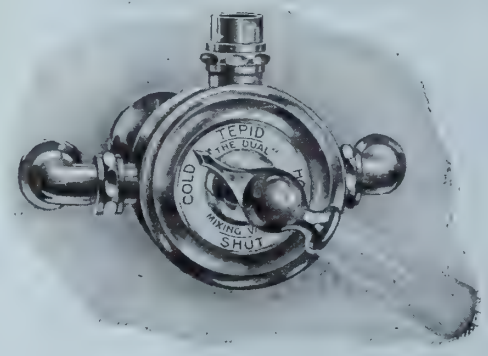
ROYAL BANK BUILDING, TORONTO

Factory: St. Catharines, Ontario

G. & W. G. GUMMER, LIMITED

EFFINGHAM BRASS WORKS, ROTHERHAM, ENGLAND

And at
9 Fenchurch St.,
London





"Dual" Mixer

A valve that really mixes Hot and Cold Water, and maintains a uniform mixture.

For ease of operation, simple construction and easy installation, it has set a new standard of efficiency.

Cold Water must be turned on first, no possibility of scalding.

Made in several forms for Showers, Sprays, Operating Rooms, etc.

At the well-known works of Messrs. Brunner, Mond & Co. these valves provide baths for 2,500 employees.

G. & W. G. GUMMER, LIMITED

Manufacturers of every description of

Engineers,' Plumbers' and Sanitary Quality Brassware

BUILDING BIGGER BUSINESS

New Business from Old Buildings

Grasp This Opportunity

Dig out your 1917 Ledger and make a list of the homes in which you repaired tank heaters during the year. Almost all of these homes can afford an Automatic Water Heater—and it's a safe bet that you can sell them a

"PITTSBURGH"

You're as good and maybe better than the average salesman. You can't tell until you try. Do not wait for the business to come to you. You can make more money by selling and installing one "Pittsburgh" than you can on 10 odd repair jobs.

If you would like us to circularize your prospects with educational advertising literature before you call on them, send us your list—we are only too glad to help you make some money.

PITTSBURG WATER HEATER COMPANY

CANADIAN WAREHOUSE:

124 RICHMOND STREET WEST, TORONTO

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Winnipeg | **Montreal** 99 Drummond Street | **Toronto** 12 Queen Street East | **Calgary**

Becoming a Bigger Man

WHAT is the difference between some men you know and others known to you? Why are some men earning $3,000 a year and some $30,000? You can't put it down to heredity or better early opportunities, or even better education. What, then, is the explanation of the stagnation of some men and the elevation and progress of others?

We are reminded of a story. A railroad man, born in Canada, was revisiting his home town on the St. Lawrence River. He wandered up to a group of old-timers who sat in the sun basking in blissful idleness. "Charlie," said one of the old men, "they tell me you are getting $20,000 a year." "Something like that," said Charlie. "Well, all I've got to say, Charlie, is that you're not worth it."

A salary of $20,000 a year to these do-nothing men was incredible. Not one of the group had ever made as much as $2,000 a year, and each man in the company felt that he was a mighty good man.

Charlie had left the old home town when he was a lad. He had got into the mill of bigger things. He developed to be a good man, a better man, the best man for certain work. His specialized education, joined to his own energy and labor sent him up, up, up. To put it in another way: Charlie had always more to sell, and the world wanted his merchandise—brain, skill and ability. Having more to sell all the time, he got more pay all the time.

Charlie could have stayed in the old home town; could have stagnated like others; could have been content with common wages. In short, Charlie could have stayed with the common crowd at the foot of the ladder. But Charlie improved himself and pushed himself, and this type of man the Goddess of Fortune likes to take by the hand and lead onward and upward.

Almost any man can climb higher if he really wants to try. None but himself will hold him back. As a matter of fact, the world applauds and helps those who try to climb the ladder that reaches towards the stars.

The bank manager in an obscure branch in a village can get out of that bank surely and swiftly, if he makes it clear to his superiors that he is ready for larger service and a larger sphere. The humble retailer can burst the walls of his small store, just as Timothy Eaton did, if he gets the right idea and follows it. It is not a matter of brain or education so much as of purpose joined to energy and labor. The salesman or manager or bookkeeper or secretary can lift himself to a higher plane of service and rewards if he prepares himself diligently for larger work and pay. The small manufacturer, the company director, the broker—all can become enlarged in the nature of their enterprise and in the amount of their income, — by resolutely setting themselves about the task of growing to be bigger-minded men.

Specialized information is the great idea. This is what the world pays handsomely for. And to acquire specialized information is really a simple matter, calling for the purposeful and faithful use of time. This chiefly.

One does not have to stop his ordinary work, or go to a university, or to any school. One can acquire the specialized information in the margin of time which is his own—in the after-hours of business. Which means: If a man will read the right kind of books or publications, and make himself a serious student at home, in his hours—the evening hours or the early morning hours—he can climb to heights of position and pay that will dazzle the inert comrades of his youth or day's work.

IF business—BUSINESS—is your chosen field of work, we counsel you to read each week THE FINANCIAL POST. It will stimulate you mentally. It will challenge you to further studious effort. It will give you glimpses into the world of endeavor occupied by the captains of industry and finance. With the guidance of the POST, and with its wealth of specialized information, you, a purposeful man, aiming to go higher in life and pay, will find yourself becoming enlarged in knowledge and ambition, and will be acquiring the bases and facts of knowledge which become the rungs of the ladder you climb by.

It is the first step which costs. But this cost is trivial—a single dollar. We offer you the POST for four months for a dollar. Surely it is worth a dollar to discover how right we are in our argument. If you have the will to go higher in position and pay, sign the coupon below.

— —

THE MACLEAN PUBLISHING COMPANY, LIMITED,
Dept. SE—143-153 University Ave., Toronto.

Send me / us THE FINANCIAL POST for four months for one dollar.

Money to be enclosed / remitted

Signed .....

.....

Real Good News



Clark Boosters Save Coal

REMEMBER THIS

There is not a sluggish hot water heating system in existence that cannot be improved, but it costs money, and lots of it, to add radiation and larger-sized boilers. Before putting your customer to a big and possibly unnecessary expense, sell him a

CLARK TEMPERATURE BOOSTER

IT'S 100% EFFICIENT



Your Jobber Can Supply You

GALT BRASS CO., LIMITED

GALT, ONTARIO

A SCARCITY of houses is reported in nearly every city and town in Canada.

An insistent demand for houses is attracting the attention of the Government and Municipalities.

"Better Housing" is the slogan, and Commissions have been appointed to make a report.

The Society of Sanitary Engineers should be represented on these Commissions. Plumbing is the most important branch in the building business, and practical men are needed to advise and suggest needed improvements in the sanitary arrangements of the home.

Now is the time to think about it! Now is the time to get ready for the building boom that is on the way, for Canada will have to provide homes for many thousand people who are coming to this fair country after the war.

In our Enamelware Factory we are doing it to-day. Cleaning up our patterns, improving our manufacturing conditions, standardizing our fixtures, cutting down costs and eliminating waste, and otherwise preparing to supply a demand that is surely coming.

If every one interested in our trade, Manufacturers, Jobbers and Contractors, worked together with that definite object in view and advertised the fact, there would be a marked improvement in our really essential business.

Port Hope Sanitary Mfg. Co., Limited

Factory:
PORT HOPE, ONTARIO

Head Office:
ROYAL BANK BUILDING, TORONTO

TORONTO SHOW ROOMS
119 King St. East

WINNIPEG OFFICE
405 Tribune Bldg.

MONTREAL SHOWROOMS
234 Beaver Hall Hill

SANITARY ENGINEER

VOL. XII JULY 15, 1918 No. 14

Fuel Saving a Patriotic Duty

Next to the War, No Problem More Vital Than Saving — Millions of Tons Wantonly Wasted Every Year in Canada Alone—Sanitary and Heating Engineers Can Become a Great Factor in Saving This Fuel

BY ONE OF US

ON page 13 of the July 1st issue of SANITARY ENGINEER, there appears an article entitled, "A chat about coal saving." This will be followed by others written along similar lines to show to what extent the fuel problem can be solved by sanitary and heating engineers.

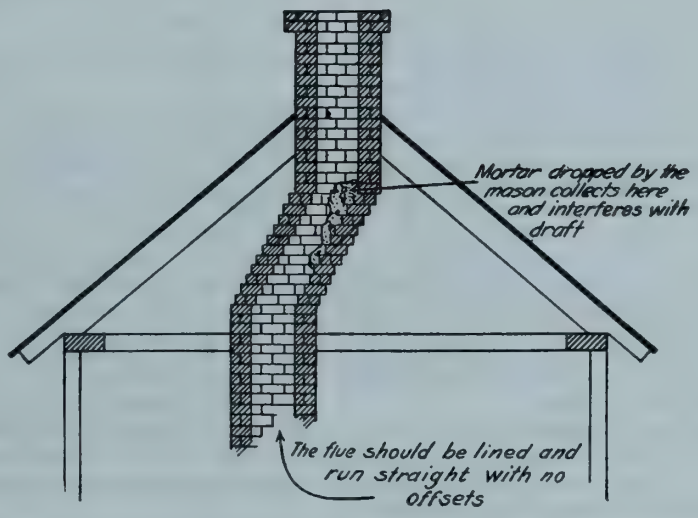
Every man engaged in the trade should be on the alert to discover anything they do which will mean a saving of fuel.

Some years ago the writer expressed the opinion that there should be some law regarding fuel consumption, the same gospel has been preached for over five years in SANITARY ENGINEER, and will be until the time comes when every furnace or other heating apparatus is installed subject to practical inspection as regards proper size, capacity, etc.

In the article in our last issue referred to above, Mr. Carron makes one or two very forceful statements. He cites cases where tons upon tons of coal are wantonly wasted, and points out the cause of this waste. He also quotes cases where, if the heating systems were under proper control, thousands of tons of fuel might be saved, and he shows that it would cost even less to save it than it does to burn it.

In no way does the conduct of the public of this continent appear so foolish and even criminal as in the reckless waste of coal which is allowed to go on day after day, and we as heating engineers cannot divest ourselves of responsibility for this waste. We appear to hold the opinion expressed by one man in Montreal, and a large jobber at that, that "It is a man's own private business what size furnace he has installed in his house."

That may be, but it is also the country's business to see that none of its citizens deliberately wastes its resources, and the man who maintains he has a perfect right to waste coal so long as he chooses to pay for it should be taught that he is committing an offence against the public welfare and against his fellow citizens. Such action is morally criminal although at present the law cannot deal with it as such. This state of affairs, however, will not last forever. The time is coming when anyone found wasting anything will be held accountable to his country for that waste and the sooner that time comes the better for us all. The man who wastes his country's resources at the present time is playing the Kaiser's game and is a fit candidate for the Iron Cross.



Section through brick chimney showing b ad effect of offset in restricting flue area.

Now let all of our calling who are at any time to make an installation or to reconstruct or repair heating appliances take upon ourselves the personal, patriotic, national duty of seeing to it that we instal and reconstruct each and every heating system in such a way as to eliminate as far as lies in our power any waste of coal. We can do it and do it in such a way as no other body of men can. We can study heat loss and practical methods of installation. We can treat every installation in its own class, instead of being too general in our decisions as to the type of system which should be installed. In fact, we want to get a little more salesmanship into our veins, and show the public that while we are in the business to make money, we are not going to be a party to low initial cost of installation as the cost of our country's resources.

If the writer could instill the idea into the minds of every heating engineer that to be a party to coal wasting is about the worst crime next to taking life he would feel he had done a service to this world second to none. The trouble is that most business men, in fact almost everybody, is too commercial in his everyday life. We are too much wrapped up in making money and spending money, and we do not count the cost.

Just imagine! It is estimated that in Canada we are wasting directly and indirectly eight million tons of coal every year, and unless some measures are taken to prevent this waste we are likely to waste more. The question may be asked, how do we waste so much, and why are matters likely to get worse?

In the first place, we venture to state that not ten per cent. of our heating ssytems now in use is installed upon a basis of the heat loss of a building, grate area of the heat loss, or type of building in which the systems are in-

stalled. As Mr. Carron says in his article when referring to this latter question as to type of building:

"Take schools for instance, they do not require very much heat from 4 o'clock in the afternoon until 9 o'clock next morning, from Friday afternoon until Monday morning, or during holidays, and they do require ventilation, which in this climate cannot be secured by hot water circulation. Likewise stores and warehouses require very little heat at night or from Saturday noon until Monday morning and on holidays.

If a heating system can be installed that can conform to these conditions, then we shall have a plant that will do what is required with the minimum amount of fuel, and save vast quantities of fuel that is now every night, every week-end, and every holiday burned up uselessly—wasted.

Such a system can be secured by circulating vapor instead of hot water. Vapor heating is not new, but we do not seem to have been keeping up with the procession; we are a conservative people, and in the matter of heating anyway seem satisfied to go on using the same heaters and the same methods as we did twenty-five to thirty years ago in spite of the march of progress, for the science of heating has not stood still any more than has that of electricity or aviation, or for that matter any other science.

We allow the public to demand, or accept, the cheapest possible type of heating. We do not as a rule point out that a certain type of installation, size of furnace and amount of radiation which happens to be specified, very often by a bulk contractor or non-technical architect, is not the proper one to install. Just this last winter the writer was asked to lok over a heating plant, hot water, and the heating engineer had taken for granted that his only interest in the job was furnishing the boiler and the radiation. Method of installation did not amount to a "row of beans to him," and at least 30 per cent. of the fuel burned was wasted.

SANITARY ENGINEER has been asking that the trade take up this question, and many have promised to cooperate with us, but when it comes down to real action they balk. Why? Because very few have the inclination to become public servants. They have been too often creatures of circumstances, and have installed heating systems far too small for the work expected of them.

These men fear the criticism of the public, when as a matter of fact they were as we stated before simply creatures of our present system.

What we want, and want badly, is practical heating laws, laws that will warrant the elimination of coal waste. We want laws that will demand that the heat loss of every building be given. We want every heating system to be under automatic control, and every building also to have that type of heating system best suited for it. We also want the annual inspection of all heating boilers, so that any alterations and reconstruction work will be properly checked. One gentleman stated some time ago that "we could do all we liked in the way of allowing certain sized furnaces and amount of radiation in a building, but," said he, "if a small addition were made to a building, someone would come along and say that the furnace would carry a little more or so on, and the whole heating law would be upset."

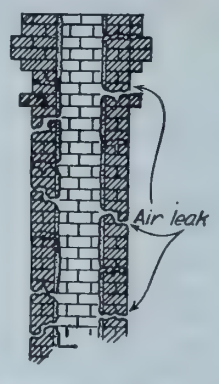
Such a condition, however, could not exist if an annual inspection of all heating boilers, furnaces and heating systems generally was in operation.

The reason why the writer believes that matters will get worse rather than better is on account of the high cost of materials, particularly those used in the erection and equipment of buildings Even to-day there are furnaces being installed and radiation that is not by any means adequate; cost of labor and the class available, too, is doing much to aggravate the situation. Warm air furnaces are being installed where steam or hot water systems should be. Property owners who rent houses declare that "they do not have the coal to buy." Very little attention is paid to matters of construction that would make a building less difficult to heat, and last, but not least, heating engineers are not salesmen, and, as we said before, they are most interested in the price, so as to secure the job. This would all be eliminated if we had practical fuel saving heating by-laws in operation.

Now, to remedy matters, the following rules should be carried out or kept in mind by every heating engineer when tendering on a job.

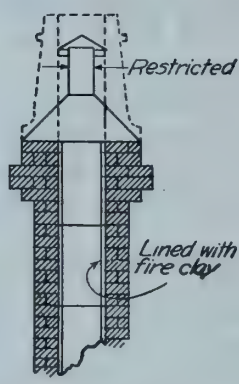
First, proper size of chimneys, smooth interior, round if possible, and free from obstruction, see Figs. 1 and 5.

Second, proper location of furnace so as to eliminate long smoke pipes and



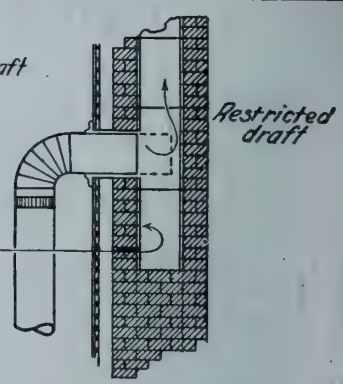
Defective or broken mortar joints admit Air and check draft

Fig. 2



Improper cap restricts draft Flue should run full size as shown by dotted lines

Fig. 3



Smoke pipe must not project into flue as shown by dotted lines

Fig. 4

care when placing smoke pipe with side of chimney, see Fig. 2.

Third, if a chimney cap or extension is made, it should never be restricted in area, see Fig. 3.

Fourth, when trying to locate any chimney troubles, see that that portion of the chimney which extends above the roof is not full of cracks and crevices which admit air, causing a defective draft, see Fig. 4.

Fifth, no matter what kind of heating system, it should be automatically controlled, see Fig. 6.

Sixth, every furnace and the piping should be covered with asbestos covering; if warm air furnaces, a double ply of air-cell asbestos paper.

Seventh, if warm air furnaces are in-

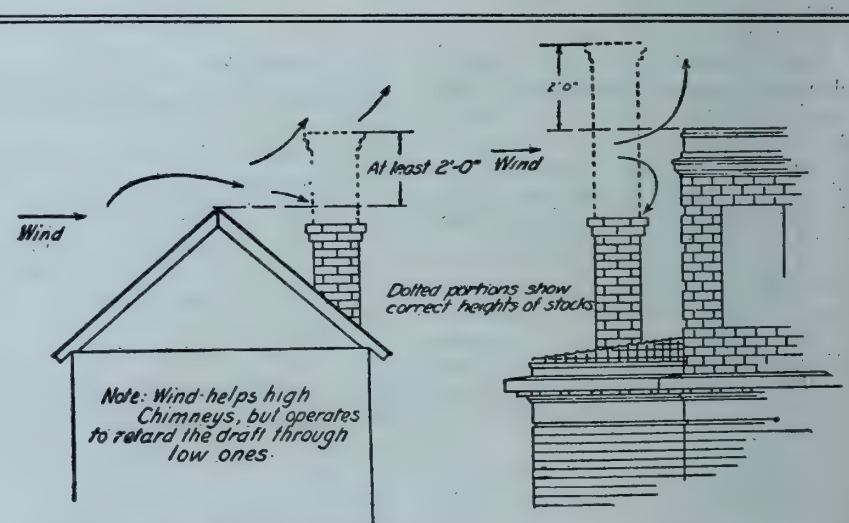
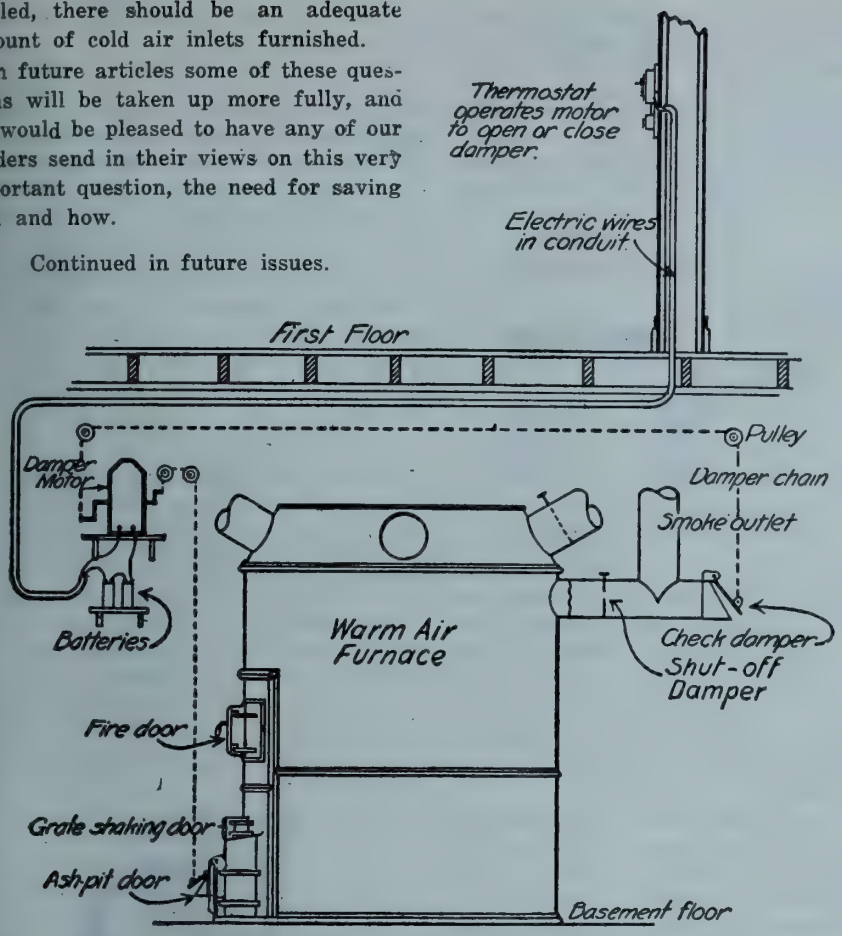


Fig. 5. The Chimney should be extended at least two feet higher than peak of roof.

stalled, there should be an adequate amount of cold air inlets furnished.

In future articles some of these questions will be taken up more fully, and we would be pleased to have any of our readers send in their views on this very important question, the need for saving fuel and how.

Continued in future issues.



Section through first floor and basement showing how a furnace should be equipped with automatic controlling device.

AN UNFORTUNATE APPOINTMENT

Professor Goodwin, speaking at the annual meeting of the Canadian Manufacturers' Association, quoted from a Canadian technical paper to prove some interesting information he was presenting to the Association, and said: "The fact that we now have a technical paper devoted to the chemical industry in Canada is a most encouraging factor in the development of this most important feature of Canadian life."

Yet, M. E. Nichols, for whom Hon. Wesley Rowell says he hand-picked Canada to fill the $6,000 job of Director of Public Information, after careful investigation says that technical papers are of no value, and that they should not be admitted to the Canadian newspaper mails. A man who made such a gigantic failure of his own newspaper property is hardly an authority on Public Information, much less on Technical Information. Any man who can supply the public with general, special or technical news, such as they want, can make a success. Mr. Nichols failed to give the people of Montreal what they wanted in the way of news. He squandered over $500,000 of friends' money in trying to establish *The Mail* in opposition to *The Gazette*, but the latter came out of the fight stronger and more reputable than ever.

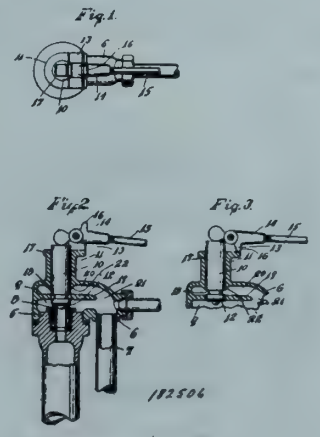
New Canadian Patents

No. 182,506.

Owen Hugh Jones, Hartford, Connecticut, U.S.A., 26th February, 1918; 6 years. Filed 12th November, 1917. Receipt No. 287,502.

Claim.—1. A ball cock including a body with an outlet chamber therein having an outlet therefrom, said body also having a relief chamber opening to said outlet chamber within the body, a valve plunger located within the body and closely fitting the wall between the outlet and relief chambers and having an annular groove positioned to pass into said relief chamber when the valve is open, and means for operating said plunger.

2. A ball cock including a body with a chamber therein, a diaphragm extending across said chamber and dividing it into two parts constituting a relief chamber and an outlet chamber the relief chamber opening to said outlet chamber, valve plunger located within the body and closely fitting the opening through said diaphragm and having an annular groove positioned, to pass into said relief chamber when the valve is open, and means for operating said plunger.



No. 182,506. Ball Cock.

3. A ball cock including a body with an outlet chamber therein having an outlet therefrom, said body also having a relief chamber opening to said outlet chamber, said structure also having a plunger extending through the wall between said chambers, a valve plunger located within the body and closely fitting said opening and extending through said plunger opening, said plunger having an annular groove that is closed by the wall of said opening when the valve is in its closed position, and means for operating said plunger.

4. A ball cock including a body with a chamber therein, a diaphragm extending across the chamber dividing it into a relief and an outlet chamber, said diaphragm having an opening therethrough, a valve plunger located within the body and closely fitting said opening and extending through said opening and having an annular groove that is closed by the edges of the opening through the diaphragm when the valve is in its closed position, and means for operating the plunger.

5. A ball cock including a body with a chamber therein, a diaphragm extending across said chambers and dividing it into two parts, a relief chamber and an outlet chamber, the relief chamber opening to said outlet chamber, and a valve

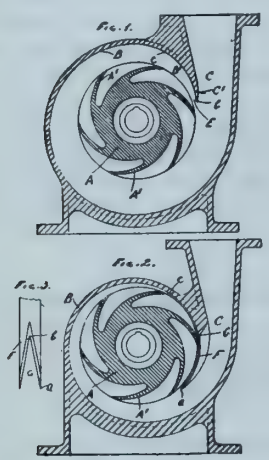
plunger of substantially uniform diameter located within the body and composed of a single piece of material with an annular groove therearound, said groove being located in said relief chamber when the valve is away from its seat to prevent, when the plunger is off from its seat, flow of liquid between the plunger and the wall of the opening in the ball cock in which said plunger is located.

No. 182,209.

Alfred Ernest Lole, Jacksdale, Nottingham, England, 12th February, 1918; 6 years. Filed 12th December, 1917. Receipt No. 288,633.

Claim.—1. In a centrifugal fluid pump in combination, a rotary impeller, a delivery pipe, a casing for said impeller, and a wall within said casing concentric with said impeller, said well formed with a discharge opening leading from said casing into said delivery pipe, said opening being gradually reduced in width, substantially as described.

2. In a centrifugal pump in combination, a rotary impeller, a delivery pipe, and a casing for said impeller, said casing



No. 182,209. Rotary Pump.

provided with a wall concentric with said impeller, said wall formed with a discharge opening leading from said casing into said delivery pipe and gradually reduced in width, and said casing formed with a continuation of said wall concentric with said impeller and extending a distance equal to about one-sixth of its circumference.

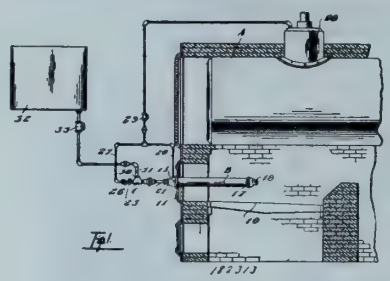
3. In a centrifugal fluid pump in connection with an air extractor of the Leblanc type, a rotary impeller, and a casing for said impeller, said casing having a wall concentric with said impeller and formed with a fluid discharge opening extending along said wall and gradually reduced in width, and having a fluid outlet also gradually reduced in width.

No. 182,313.

Edwin J. G. Macintyre, Clarence, and Bernard J. Nolan, assignee of a half interest, Ottawa, both in Ontario, Canada, 12th February, 1918; 6 years. Filed 15th October, 1917. Receipt No. 286,436.

Claim.—1. An oil burner of the class described comprising an inner tube having a plurality of curvilinear slots therein staggered relatively to each other, a pipe surrounding the tube and spaced therefrom forming an annular passageway, means for delivering fluid to the annular passageway.

2. An oil burner of the class described comprising a tube provided with a plur-



No. 182,313. Oil Burner.

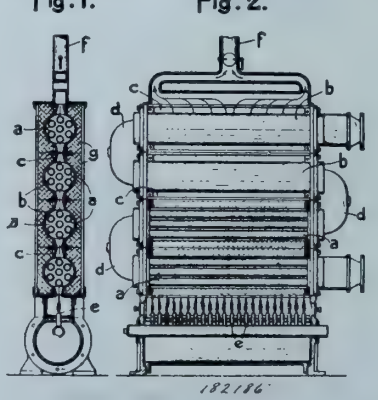
ality of curvilinear slots therein, a pipe surrounding the tube spaced therefrom forming an annular passageway, a jet on the pipe having curvilinear slots therein, ejector means for delivering a mixture of oil and fluid to the tube, and means for delivering fluid to the annular chamber to intermix with the fluid and oil and complete the vaporization of the oil.

3. An oil burner of the class described comprising a tube having a plurality of curvilinear slots therein, a cap on one end of the tube forming a dead end, an ejector operatively connected to the other end of the tube, means for delivering a mixture of oil and fluid to the tube, and means for delivering fluid to the mixing chamber to complete the vaporization of the oil.

No. 182,186.

Emil Heefely, Basel, Switzerland, 12th February, 1918; 6 years. Filed 15th September, 1916. Receipt No. 269,866.

Claim.—1. A heater consisting of a plurality of horizontally disposed heating chambers superimposed one above the other, each chamber consisting of a casing, a plurality of tubes extending longitudinally through the casing, and chan-



No. 182,186. Heater.

nels connecting the adjacent casings, said channels being arranged diametrically opposite each other, and a source of heat located in the base of the heater, designed to deliver hot gases successively to the said chambers.

2. A heater consisting of a plurality of horizontally disposed heating chambers superimposed one above the other, each chamber consisting of a casing, a plurality of tubes extending longitudinally through the casing, and channels on diametrically opposite sides of the casing, forming connection between the adjacent casings, hollow bends alternately connecting successive chambers to form a tortuous passageway for the flow of fluid to be heated, and a source of heat located in the base of the heater designed to deliver hot gases successively to the chamber.

"HOT-FLO" ELECTRIC FAUCET

The introduction to the Canadian market is being made of a new hot water faucet. This is designed to meet the demand for a faucet which will deliver hot water through the medium of applied electric current as a heating agent, and it is claimed that it possesses the advantages desired. The fixture is made of brass, is neatly designed and finished in full nickelled effect. Attachment is made to the regular water supply as with an ordinary faucet which it may thus re



New "Hot-Flo" Electric Faucet.

place. The attachment once made, all that is essential is that the plug attached to the regular cord used be inserted in any electrical socket. This done, the faucet handle is turned and releases the cold water. This will continue to run as cold water until a second turn of the faucet handle makes the electric connection and heats the running water instantly. The volume of hot water obtainable depends somewhat upon the original temperature of the water. The flow is approximately 24 gallons per hour at an average temperature of 110 degrees. Other features claimed by the manufacturer are that of a thorough insulation, the possibility of using this tap on grounded or ungrounded systems, and a screw adjustment making it adaptable to any water presure. The Electrical Products Corporation of Canada, 120 Transportation Bldg., Montreal, are Canadian agents.

How to Develop Furnace Boot

Problem of Rectangle to Round Sheet Metal Boot Described and Illustrated — Sizes Given by Enquirer Much Larger Than Those Generally Used in Furnace Work

By Thomas Stansfield.

A READER asks how a rectangle to round boot pattern must be developed. Sizes given are: 24 inches high, 24 inches diameter, with rectangle 32 inches by 14.

The first step to take is to draw a plan and side elevation as shown in Figs. 1 and 2, and divide the circle into four parts. Then divide two of these parts into six equal parts each as described by 1, 2, 3, 4, 5, 6 and 7. It will be seen that the rectangle is marked A B C D. From point A draw a number of lines to 2 3 4 5 6 and 7, and from B to 1 2 3 4 5 6 and 7. It will be seen that points B 4 and 3 are in direct line with each other, so that the one line will suffice.

Now turn to Fig. 3 and draw a vertical line E F with line G at right angles. Next mark off the height of boot as shown in Fig. 2 at H J on vertical line and the distance will be given between points F and E. Turn again to Fig. 1 and place compass point at B, and open to point 1. Transfer this measurement to line F G in Fig. 3 by drawing an arc as shown at G 1. Again place compass at B in Fig. 1 and open to B 2, transfer this measurement to Fig. 3 on line F G and repeat until all the measurements have been used from B.

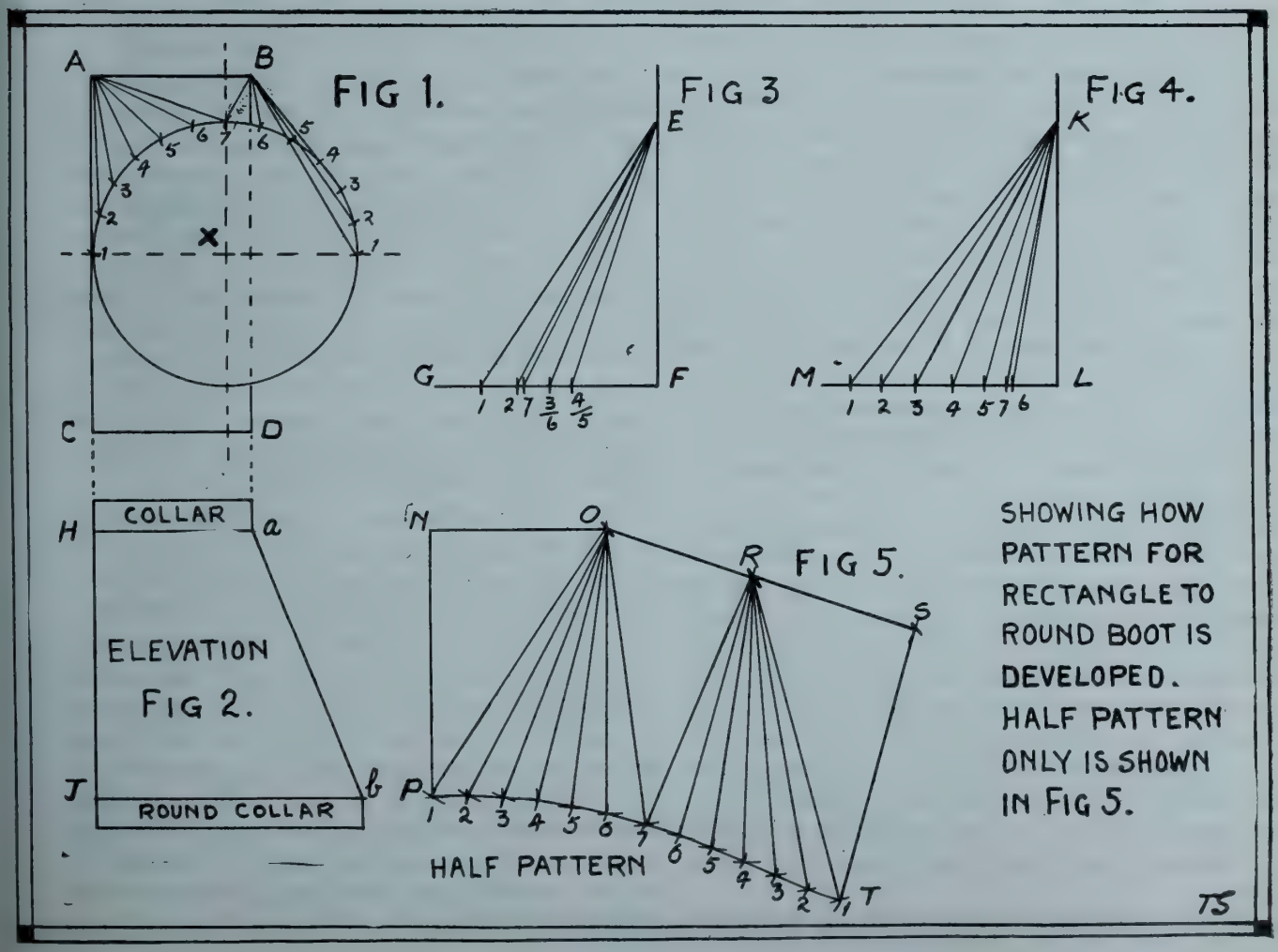
Now turn to Fig. 4 and draw lines K L M, repeating in the same order all the previous operations by placing compass at point A and opening same to 1 2 3 4 5 6 7 in turn and transferring each measurement until Fig. 4 is completed. All the details have now been procured that are necessary to commence with the developing of the actual pattern.

First draw a horizontal line as at N O with line N P at right angles to same. Let the distance between points N and O be equal to half the length of the rectangle, which in this case would be 16 inches. The length of the vertical line N P should be 24 inches, being the length corresponding with the height of the boot. See H J in Fig. 1. Turn again to Fig. 3 and draw a number of slant lines from E to 1 2 3, etc., until all the points are formed at E. It will be seen that lines 3 and 4 are the same as 6 and 5. Now, place the compass point at E and open up to 1, transferring same to Fig. 5 by placing point at O, and drawing a small arc. Next, place the compass point at P and making an arc cutting the one just made, procuring the measurement for this short arc from any of the small measurements shown in half circle at Fig. 1, 1,2, or 2, 3. It will be seen that by repeating these operations until all the measurements described in Fig. 3 to Fig. 5, at the stretchout line have been procured. Now connect all these points from P 1 to 7, with point O.

We will now turn to Fig. 1 and place compass point at A, opening same up to B. Then transfering this measurement by placing compass point at O in Fig. 5 and drawing a small arc as at R.

It is now necessary to turn to Fig. 4 and connect point K with 1, 2, 3, etc.,

(Continued on page 27.)



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VOL. XII. JULY 15, 1918 No. 14

DO NOT RESENT CRITICISM

SOME resentment has been expressed by various members of the craft on one or two occasions of late at the fact that in connection with the consideration of the question of securing the goodwill of the public certain instances have been mentioned of malpractices which reflect anything but credit on those guilty of them. It is somewhat difficult to understand the cause for any such feeling of irritation. If we genuinely desire to establish the good name of the craft with the general public, it surely cannot help us to shut our eyes to the facts and try to persuade ourselves that there is nothing wrong with us and nothing in our make-up that needs improvement. The sick man goes to the doctor for advice, the doctor points out to him how in the past he has violated the laws of nature as regards his health and how such action has conduced to his present condition. But the patient bears the doctor no ill-will for having told him the truth, rather is he grateful for having his errors pointed out and determines to avoid a repetition of them in future. So should it be with the craft in the present case. If we are genuinely desirous of establishing a reputation for square dealing we must not show resentment when we hear of cases which have made necessary our efforts to such an end. Let us rather keep our resentment for those who have been instrumental in bringing our good name into disrepute. Let our attitude comprise a recognition of the fact that in the past cases have occurred which we deplore, but that it is our intention to stamp out all malpractices and make them impossible for the future.

It is possible that the publication in SANITARY ENGINEER of one or two of the cases referred to may have appeared to some as giving unnecessary publicity to unsavory incidents but it should be remembered that this is not a newspaper issued to the general public, it is, so to speak, a family newspaper, own own craft being the family; and it is therefore the fittest medium for the open discussion of matters affecting our welfare.

URGES GOVERNMENT PLAN FOR HOUSING

A GOVERNMENT housing plan carried out by a joint partnership between Federal, provincial and municipal authorities as a solution of the war housing problem is suggested by Thomas Adams, the town planning expert of the Commission of Conservation. In support of his proposal Mr. Adams says that if the present conditions were likely to be permanent, the situation would probably gradually right itself, as the level of rents and purchase price would soon rise to meet the increased cost of construction. But owing to the likelihood of the cost of construction receding to a considerable degree after the war it is almost certain private enterprise will cease to be much of a factor in producing a supply of houses to meet the present shortage for several years to come.

GOVERNMENT AID REQUIRED

"At the present moment," says Mr. Adams, "the most urgent question is that of war housing.

"Private enterprise may be dismissed as a factor under present conditions. Apparently, therefore, we must have recourse to policy requiring Government aid, be it Federal or provincial, and Government aid involves Government supervision. The Federal Government is the authority under the War Measures Act, and housing war workers is a war measure. Therefore, this is primarily a matter for the Federal Government; although for practical purposes it should delegate as much responsibility as possible to provincial and municipal Governments. Large employers of labor who need housing accommodation should be made to co-operate in any Government scheme in their respective localities."

It is no small amount of satisfaction to SANITARY ENGINEER to read the above, particularly in view of the fact that we have for many years advocated that a Federal health department be formed.

If the Dominion Government take an interest in the housing problem, that problem will once and for all be solved, providing of course that it assume all the details involved, such as water supplies, sewage disposal and sanitary problems. It is estimated that if building operations do not move more rapidly than they have done since the war broke out, there will be approximately one million people in Canada requiring homes within five years, a shortage of at least 200,000 homes.

Let's Co-Operate, All

ONE of the biggest ventures ever attempted by the plumbing and heating trade is taking form at present in the plans being worked out by the Canadian Trade Extension Committee.

This committee represents all the manufacturers, jobbers and supply houses and is engaged in working out a scheme which will help every one in the trade to build up bigger and better business.

Two of the main points for consideration are the thousands of houses in our towns and cities that have very poor and inadequate plumbing and heating equipments that should be re-modelled; the plumbing so that conditions will be made sanitary, and therefore safeguard the health of our citizens, the heating so that fuel will be conserved, and better health maintained as well as the transportation problem made so much less difficult to solve.

Secondly, that as the farmer and rural residents were never so well off financially as they are at present, it is up to the sanitary and heating engineer to cultivate the farmer's business, and get right after these rural residents, showing them how essential it is that they have their homes equipped with city conveniences.

The scheme above referred to will involve the expenditure of a large sum of money, and can only be a real success providing every member of the craft lends his hearty co-operation.

It is a case where real hard plugging is needed. Each must have the will to do his part and must do it quickly and well.

SANITARY ENGINEER will endeavor to show how each and everyone can do his part. All kinds of ideas will be worked out and "sales helps" given to its readers. Suggestions will be made out to how the employer and employee should get closer together and thus help this splendid scheme along.

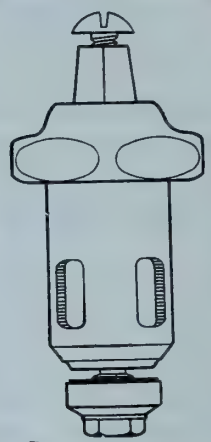
Remember, Mr. Reader, the success or failure of this Scheme depends largely upon you.

INCORPORATE THE QUATURN *LINE IN*

LOOK



The Work-ing Unit or



Structure

It's The Whole Works



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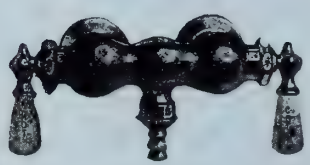
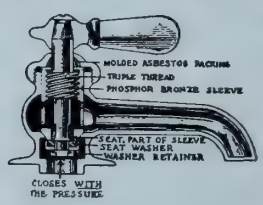


PLATE A. 3500



SECTIONAL VIEW



PLATE A. 3200

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What does this mean for your customer? It means that he has the only standar
always remember you every day, morning, noon and night, as being a progressive
such service. He will tell his friends about you. No one forgets those who render
"Quaturn" Brass Goods. Write for our Catalogue "A" and see the thirty-seven diff



PLATE A. 1900

Ask your jobber about these goods, he can sup

WALLACEBURG BRA

WALLACE

BIGGER BUSINESS BUILDING CAMPAIGN



PLATE A. 200



PLATE A. 400



PLATE A. 300

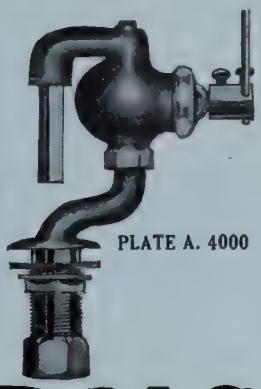


PLATE A. 4000



PLATE A. 3900

A FEW QUATURNS

n is doing more towards attaining the highest degree of efficiency than anything else in the arly is this true of Brass Goods for domestic sanitary equipment, such as Bath Room, Kitchen es. In this we have made the only real progressive step, because we have made a Standard- that fits all Quaturn Plumbing Fixtures.

ery office or factory building that is fitted up with the Quaturn line of Brass Goods has the only e market.

t piece requires repairing one Quaturn Structure or Working Unit will permanently repair it, od as new, because there is no wearing parts in connection with the body of the fitting. Every ble. A piece made for a Bibb will fit a Bath Cock, Basin Cock, Laundry Bibb or any other

UNIT IS THE WHOLE WORKS

this mean to you? It means that when you make Quaturn your line, when you install ression Work, you adopt a standard, you have made the first local progressive move pportunity of making in connection with Brass Goods.

no matter what fixtures require repairing you know what is wanted. You do not ousand and one kinds of repair parts, you know there is only one piece needed, and e, because it's a "Quaturn."

s Goods that is made and fitted in his home or office building, it means that he will ngineer. That you gave him the best from every standpoint and he will appreciate vice and the service you first rendered him was when you supplied him with s of "Quaturn." One unit will interchange with all or any of them.

d remember the working unit is the *Whole Works.*

& IRON MFG. CO., LTD.

G, ONTARIO



PLATE A. 2000

Giving Employment to Returned Army

35,000 Home and 60,000 Disabled Men a Possibility Any Time — Study of Problem Shows it Requires More Than Superficial Thought

Written for MacLean Publishing Co. by C. Norman Senior, Department of Soldiers Civil Re-establishment.

(Continued from last issue.)

IN order that the men may be scattered as widely as possible through the commercial and industrial ranks, the policy of training them in the industrial establishments themselves rather than in technical schools and class rooms has been adopted. To train these men in schools would mean the establishment of large training centres where, at the most, probably 20 or 25 different courses could be established. Under the system adopted by the department of placing them with employers to receive their training in the very conditions where they will subsequently work the number of occupations for which men are being trained already numbers 175, and is rapidly increasing.

Majority Can Earn Their Living

While it is true that these disabled men are limited in their scope as a result of their war injuries, it is also true that hardly any of them are absolutely debarred from earning their own living. The results of the vocational training already done have amply demonstrated this. When a blind man can be a stenographer, a one-armed man a telegrapher, a man with both legs off a machinist, and so on, it will be seen that there is some kind of opening for every one of them.

As far as possible it is sought to place the more seriously disabled in skilled positions. The man who formerly relied upon his strength for a living—that is, the absolutely unskilled laborer—is rendered unable to go back to his old occupation by almost any kind of wound which makes him unfit for further military service. These are being trained for all kinds of mechanical work where a little more brain work is necessary and a little less manual strength is required.

System Followed to Find Employment

There is in each province a district vocational officer as well as an officer in charge of industrial surveys, whose duty it is to locate the opportunities for training. Members of the retail and manufacturing trades may well consider the opportunities within their grasp of assisting in this all-important work and communicate with these officers.

Among the courses which are being given are bookkeeping, ordinary commercial courses, typewriting and stenography, typewriter repairing, photography, show-card writing, engraving, etc. These examples are cited here because many firms find workers of these classes valuable in connection with side lines of their business. It is the desire of the vocational officers to be in touch with all sections of the community so that no opportunities for training men may be lost.

Students Supported by the Department

During the period of training, which usually lasts from six to nine or even twelve months, according to the degree of disability and the difficulty of learning the new occupation, the department supports the student and his family by means of a vocational allowance based on military pay and allowances and Patriotic Fund allowances. The vocational pay, as it is called, varies on the side of generosity from these allowances, and the student is quite able to devote his full time to the study of his new occupation. This allowance is paid even when the man is placed as an apprentice with a private firm to receive his training under employment conditions.



Soldier with one arm taught to operate a device for a typewriter.

A close inspection of the man's progress is made to see that exploiting is not attempted, and to see that the man is making definite progress.

Government to Take a Hand

The problem of unemployment in regard to returned soldiers is a big one, and it is accentuated by the fact that they are returned soldiers. It is one which must not be left unsolved, because its dangers are infinitely greater than any ordinary unemployment problem which has ever confronted Canada.

The question of training the disabled is one which the Government has grappled with fairly and squarely, and in which it has taken definite steps to obtain the co-operation of the employers generally. Sooner or later they will come to you to find out what the opportunities for training men are in your business.

In the meantime these facts should be considered: it is going to be good business to have returned soldiers in your place. There is a very strong disposition on the part of the public to do business with returned soldiers when it sees them. The same qualities of loyalty and steadfastness which made these men fight for their country are just the qualities you want in your own employees.

Plea for the Returned Soldier

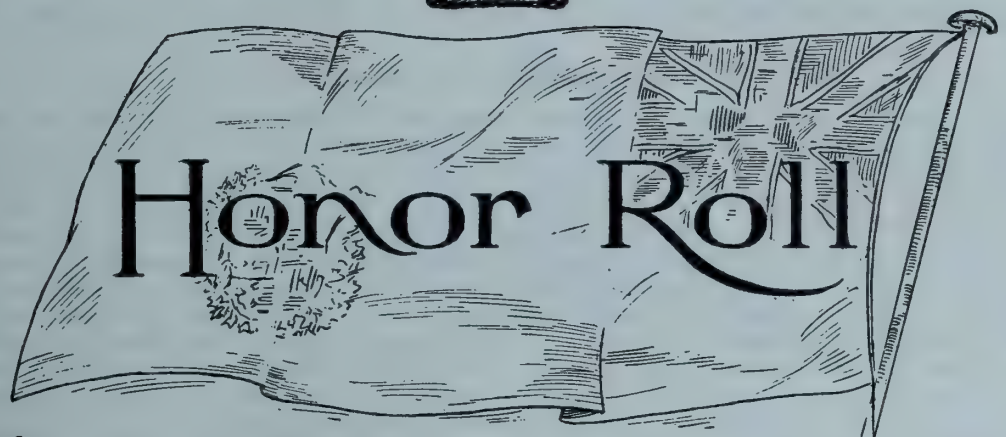
That "patience and human kindness," which the returned major mentioned, will be well rewarded. This applies not only to the disabled who need to be trained for new work, but to those men who come back fit and anxious to take their ordinary part in civil life. You will have many applications for work from them, and it cannot be emphasized too strongly that, while the problem is a national one requiring strong Government action in a centralized way, the solution will only be found if each individual employer does his bit. No matter how small your store may be, if you employ men you will find among the returned soldiers many suitable employees. It is in your interest that these men fit back into civil life just as quickly as possible. You do not want to see any class consciousness develop among them, because you know it will be hurtful not only to you, but to the men themselves. The sooner they fit back into their ordinary grooves the better for everybody, but it will be a long time if you, as individuals, always "pass the buck" to the Government.

"IT CAN BE DONE"

Somebody said that it couldn't be done,
But he, with a chuckle, replied:
That, "Maybee it couldn't, but he would be one
who wouldn't say so till he tried."
So he buckled right in, with a trace of a grin
On his face. If he worried he hid it;
He started to sing as he tackled the thing
That couldn't be done—and he did it.

Somebody scoffed: "Oh, you'll never do that,
At least, no one ever has done it."
But he took off his coat and he took off his hat,
And the first thing we knew he'd begun it.
With a lift of his chin, and a bit of a grin,
Without any doubt or quiddit;
He started to sing as he tackled the thing
That couldn't be done—and he did it.

There are thousands to tell you it cannot be done,
There are thousands to prophesy failure;
There are thousands to point out to you, one by one,
The dangers that wait to assail you.
But just buckle in with a hint of a grin,
Then take off your hat and go to it;
Just start in to sing as you tackle the thing
That "cannot be done," and you'll do it.



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Market Conditions and Tendencies

Statements Regarding the Prices and Trend of Supplies.

THE MARKETS AT A GLANCE

MANY important changes have been made in quotations on lines affecting the trade since last issue and very largely follow along predictions made in SANITARY ENGINEER. Manufacturers generally report a tightening up in the matter of supplies and consequently production is facing a decided curtailment. Stocks in some lines are getting light.

One of the most important revisions is that affecting brass goods, valves, compression bibbs, stop and waste cocks, basin and bath cocks all showing new discounts which provide for substantial advances.

Wrought iron pipe has gone to higher levels, and fittings, both malleable and cast, are on the upward trend. The scarcity of pig iron for commercial purposes is increasingly evident and is shown in difficulties experienced by manufacturers of soil pipe in securing needed supplies. Prices on soil pipe and fittings have undergone revision upward, and orders are being taken only subject to being able to supply the goods.

Some shipments of ingot tin have come to hand, but have been absorbed. Supplies to arrive are largely sold, though when further shipments will reach Canada is not known definitely. Prices are holding high, and offers of as much as $1.50 per pound have been made in an endeavor to secure spot stocks. Lead has advanced, and spelter is also higher, while antimony records an advance of from 2c to 4c per pound under increased demand.

The further strength of the lead market has resulted in an advance being made in lead pipe and waste pipe. Present quotations are 1c per pound above those ruling for some months past. A revision in values on solder has been made, and quotations now ruling are substantially below those prevailing for some time past.

Conditions in the trade generally are fair, jobbers and manufacturers reporting a fair volume of business.

TORONTO, July 12.—Important changes have been made in many lines affecting the plumbing trade since last issue, prominent in which are revised prices on wrought iron pipe, pipe fittings, soil pipe and fittings, valves, compression bibbs, stop and waste cocks, bath and basin cocks. The present basis of quotations provide, for advances in each instance. Lead pipe has also joined the list of lines to climb, while solder in a readjustment of values shows a substantial decline. Business shows a somewhat better tone generally though the manufacturers state difficulty in securing material is more marked.

Range Boilers Hold in Unchanged Position

RANGE BOILERS.—No new developments have marked the position of range boilers. These are very firm in price following advances made in sheets and the difficulty in securing sheets will undoubtedly have a bearing on the manufacturers' ability to supply boilers. The present range of quotations follows:

	Standard	Extra Heavy
30-gallon range boilers	$14.00	$17.00
35-gallon	17.00	20.50
40-gallon	20.50	24.00
52-gallon	28.00	32.00
66-gallon	37.00	42.00
82-gallon	45.00	50.00
100-gallon	62.00	70.00

Good Time to Sell Enamelware; Closets Up

ENAMELWARE.—Manufacturers' prices on enamelware in Canada to-day average about 15 to 20 per cent. lower than those in the United States, which means that the builder can secure his lines to-day probably 25 per cent. below their market value. This is a point that might be used by sanitary engineers to encourage building operations and increase sales. The market locally is very firm and how long manufacturers can hold at present basis is hard to determine. An advance of $2.00 each in closets will be noted in quotations below:

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Sinks, roll rim, 18 x 30 in., staple	16 80
Closets, oak tank and seat	24 00
Do., enamel iron or white vitro tank	26 00

Soil Pipe and Fittings Higher; Pipe Fittings Too

SOIL PIPE, FITTINGS.—In line with conditions outlined in SANITARY ENGINEER in the past couple of issues, prices on soil pipe and fittings show an advance in revised discounts below. Pipe fittings, both cast and malleable, are also on an upward trend. Quotations below given present scale of discounts or net prices.

SOIL PIPE FITTINGS.

Medium and extra heavy soil pipe, 6-inch and under	30%
8-inch soil pipe	25%
Medium and extra heavy fittings and under	40-40 & 2½%

C. I. PIPE FITTINGS.

Cast iron fittings	Net List
Plugs	15%
Bushings	18%
Flange unions, standard	Net List
Dart unions, ¼-inch to 2-inch	15%
Do., 2½ in. and larger	6½%
Nipples, up to 4-inch	45%
Do., 4½-inch and larger	40%
Do., running thread 4-in. and under	25%
Couplings, 4-in. and under	35%
Do., 4½ in. and larger	15%

MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittgs., Class A, lb.	.60	.75
Do., Class B., lb. net	.27	.37
Do., Class C., lb. net	.19	.27

Waste Holds Steady; Oakum Higher

WASTE, OAKUM.—Business holds good in waste and the market shows no change during the past fortnight. Manufacturers intimate that orders are coming along freely and they are operating at capacity.

An advance of $1.00 per 100 pounds has been made in some quarters on plumbers' oakum. This brings to-day's price to $11.00. Other lines are unchanged.

	Per 100 lbs.
Best American	$21 50
Clipper, spun	21 00
Do., unspun	19 50
Plumbers', spun	10 00 11 00

Valves, Compression Bibbs, Cocks All Revised

VALVES.—Revised prices have been issued on valves, stop and waste cocks, compression bibbs, etc., the new discounts established providing for advances in each instance. This is in line with definite predictions made in SANI-

TARY ENGINEER last issue. Present range of quotations follows:

	Discount off list
Ground work	42
Compression work, standard	47
High grade	41
Cushion work	40
Fuller work, standard	45
High grade	38
Basin cocks, No. 0 standard	40
Nos. 1 and 2	40
Bath cocks	50
Flatway stop and waste cock, standard	50
High grade	47
Roundway stop and waste cocks, standard	50
High grade	47
Brass steam cocks, standard add 10%.	
Globe, angle and check valves, standard.	Net
Do., removable seat	Add 5%
Radiator valves, standard	10
Do., removable seat	Net List
Patent quick opening valves	30
Basin Cocks—	
No. 0 and 1, Fuller pattern	45
Globe, angle and check valves, standard, medium pressure	20
Radiator valves, standard med. pressure.	30
Radiator valves, removable seat, medium pressure	25

Wrought Iron Pipe Goes Higher

WROUGHT IRON PIPE.—A slight advance in the schedule of prices obtaining on wrought iron pipe has been made and is shown in panel herewith. This would seem to be warranted under conditions prevailing now regarding supplies of skelp and difficulty in securing for manufacturing purposes, and follows along forecast made in these columns in the last issue.

NEW SCHEDULE OF PRICES ON WROUGHT IRON PIPE

Price List No. 36 (July 5, 1918)

	Black Per 100 feet	Galvanized Per 100 feet
Standard Buttweld		
⅛ in.	$ 6 00	$ 8 00
¼ in.	5 22	7 35
⅜ in.	5 22	7 35
½ in.	6 63	8 20
¾ in.	8 40	10 52
1 in.	12 41	15 56
1¼ in.	16 79	21 05
1½ in.	20 08	25 16
2 in.	27 01	33 86
2½ in.	43 29	54 11
3 in.	56 61	70 76
3½ in.	71 76	88 78
4 in.	85 02	105 19
Standard Lapweld		
2 in.	29 97	36 45
2½ in.	45 05	55 28
3 in.	58 91	72 29
3½ in.	73 50	91 54
4 in.	87 20	108 45
4½ in.	99 06	123 82
5 in.	115 40	144 30
6 in.	149 80	187 20
7 in.	195 20	243 95
8 L in.	205 00	256 25
8 in.	236 20	295 20
9 in.	282 90	353 25
10 L in.	262 40	328 00
10 in.	337 80	422 30

Terms 2% 30 days, approved credit. Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Some Tubes Arriving; Situation Serious

BOILER TUBES.—There are some boiler tubes in transit but time of arrival is not even hinted at. These will afford some relief, it is thought, but will by no means overcome present shortage. The situation can be termed still serious. There is no change in prices.

Toronto—	Per 100 feet Cold drawn	Lapweld
1 inch	$36 00	$ ....
1¼ inch	40 00	....
1½ inch	43 00	36 00
1¾ inch	43 00	36 00
2 inch	50 00	36 00
2¼ inch	53 00	38 50
2½ inch	55 00	42 00
3 inch	64 00	50 00
3¼ inch	....	58 00
3½ inch	77 00	60 00
4 inch	90 00	75 00

Sheets Moving Freely; Plates Grow Scarce

SHEETS, PLATES.—A splendid trade on sheets and plates is reported and in some quarters a decided scarcity of 10-gauge and heavier has developed. Present restrictions preclude the possibility of renewing stocks for some time to come and stocks generally must continue to dwindle though very good supplies are said to be available in some quarters. Prices hold unchanged at following figures:

	Per 100 lbs.	
BLACK SHEETS—		
10 gauge	$....	$10 00 $12 00
12 gauge	....	10 10 10 00
14 gauge	7 45	7 90 8 40
16 gauge	7 50	8 00 8 50
18-20 gauge	7 80	7 55 8 05
22-24 gauge	7 85	7 60 8 10
26 gauge	7 90	7 65 8 15
28 gauge	8 00	7 75 8 25
3-16,inch plate	....	10 10 10 25
¼-inch boiler plate	....	.... 10 00
GALVANIZED SHEETS—		
10¾ oz.	$9 50	$9 75
U.S. 28	9 20	9 45
U.S. 26	8 90	9 15
22 and 24	8 75	9 00
18 and 20	8 60	8 85
16	8 45	8 70
14	8 35	8 60

Lead Pipe Goes Up; Solder Somewhat Easier

LEAD AND ZINC PRODUCTS.—An advance in lead pipe and waste pipe of 1c per pound has become effective since last issue, making to-day's quotations 15c and 16c respectively. No change on traps and bends, sheets or wool has yet been made.

A readjustment of values on solder has been made which has resulted in a somewhat lower scale of prices being arrived at. Guaranteed at 60c, strictly at 55½-56c, commercial at 51-52c, and wiping at 55c per pound are the range of quotations now being named. Wire solder prices range from 70 to 80c per pound. Manufactured lead products hold firm and unchanged at advance recorded last week. The present range of quotations follows:

Lead pipe, lb.	$0 15	$....
Lead waste pipe, lb.	0 16	....
Lead traps and bends	Net list.	
Lead wool, lb.		0 16
Lead sheets, 3 to 3½ lbs. sq. ft., lb.		0 13¼
Lead sheets, 4 to 8 lbs. sq. ft.		0 12½
Cut sheets, ¾c lb. extra, and cut sheets to size, 1c. lb. extra.		
Solder, guaranteed, lb.	....	0 60
Solder, strictly, lb.	0 55½	0 62½
Solder, commercial, lb.	0 51	0 52
Solder, wiping, lb.	....	0 55
Solder, wire, lb.	0 70	0 80
Zinc sheets	....	0 26

Tea Lead, Lead Pipe Higher; Business Quiet

OLD MATERIALS.—Higher prices have been named on tea lead and heavy lead pipe in sympathy with strong tone of pig lead market. Business continues very quiet and no excitement is shown in trade circles.

Tea lead	$0 05¼	$....
Heavy lead pipe	0 07½	0 07¾
Yellow brass	0 12	0 13
Red brass	....	0 21
Light brass	....	0 09½
Heavy zinc	0 05½	0 06
Heavy copper	0 21½	0 22
Stove plate, per ton	17 00	18 00
Old cast iron, per ton	25 00	26 00

Lead, Spelter, Antimony Higher; Tin Still Scarce

INGOT METALS.—Lead, spelter and antimony have all made substantial advances and are being held in a very firm market. A shipment of tin reached the local market but has been absorbed, and a very large proportion of tin to arrive is sold. When further shipments will arrive is uncertain.

COPPER.—The advanced price of copper in the United States has been reflected here, quotations locally ranging from 30c to 32c per pound. This metal is reported very scarce locally, little coming through from the south other than for war orders.

TIN.—This metal is still scarce and supplies difficult to procure. Some has arrived but was quickly absorbed and the bulk of this metal to arrive is sold. Quotations show a wide range from $1.15 to $1.35 per pound and even $1.50 has been offered.

SPELTER.—An advance of over 1c per pound has been made and new price is being firmly held. The demand is somewhat quiet at the present time. Quotations now range from 10½ to 11c per pound.

LEAD.—Further advances are to be noted in prices now ruling of 10½ to 11c per pound. Quotations at primary points are very firm and this is reflected here. There is a fair movement of lead but this market is not extremely active.

ALUMINUM.—Little interest centres in this metal commercially, government requirements largely absorbing available supplies. Quotations are made at 50c per pound.

ANTIMONY.—Under the influence of a heavier demand prices show a decided stiffening, advances ranging from 2c to 4c per pound, bringing quotations locally up to 18c to 20c per pound.

PIG IRON.—Commercially there is little new to report with regard to pig iron. War demands are absorbing the entire output and as long as these conditions exist little may be expected for commercial purposes. Prices remain unchanged.

NEW BY-LAW PUT INTO OPERATION

The city of Brantford, Ontario, is to be complimented upon having recently put into operation an up-to-date plumbing by-law. It will be published in SANITARY ENGINEER at an early date along with a few practical comments of interest to the trade. There are quite a number of novel clauses in it that will make it well worth careful reading.



GOSSIP OF THE TRADE

CONTRACTS AWARDED

Elliott Bros. for the plumbing in connection with the change of the Collegiate Institute lavatory system at $4,385.

The property committee of the Board of Education, Kingston, awarded the following contracts: McKelvey & Birch, smithing, painting and mason work in connection with the improvement of the lavatories in Victoria, Sydenham, Louise and Central Schools at $6,067.

The Western Union Cable Co. are erecting a staff house and several dwellings at Heart's Content for the convenience of their employees, which when completed will be a credit to the cable town. The contract for plumbing has been awarded Moore & Co. of this city who are now making the necessary arrangements. The buildings will also have electric light and private phone connections. An up-to-date and commodious cable station is also to be erected in the near future, plans for the same are now being drafted by Mr. Jonas Barter, architect. The buildings are being erected by Messrs. Saunders and Howell, of Carbonear.

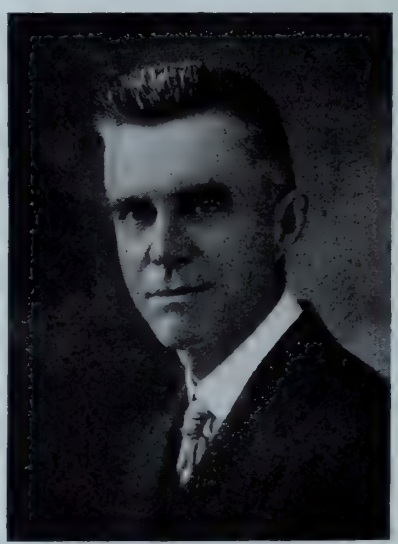
METERS WOULD SAVE WATER AND FUEL

If the city of New Westminster, B.C., would put in about a thousand more meters, it would have water "to burn," and the rentals would eventually pay for the meters. This is how Water Superintendent John Ankers sums up the situation after going into comparative figures of the per capita consumption in relation to the fact that the high level reservoir continues to go down despite the department's appeal to consumers to conserve the supply. To get their water service metered might seem to some citizens a drastic method, but it would be nothing compared to their resentment should a big fire occur and the water department be found without the necessary water to fight it.

The publicity this matter has received has helped but little, according to Mr. Ankers. Instead of dropping the customary five inches in a day, the reservoir is now going down about four.

On the customary basis of five persons to the service, that means a population of 8 500, and with a normal supply of a million gallons per day, the consumption would be 118 gallons to break even. At present, however, the daily supply is 1,200,000 gallons which is equal to a consumption of 141 gallons.

This is just one of the many matters that have a bearing upon fuel consumption, and in spite of the persistent apathetic spirit on the part of the public, the Federal Government should have some measures or laws put into force that would give power to demand that waste of all kinds shall be eliminated wherever it occurs throughout Canada.



J. F. L. Carron, Montreal.

A CORRECTION

In connection with the article which appeared on page 13 in last issue entitled, "A Chat About Coal Saving," a mechanical error crept in. The compositor unfortunately dropped in the wrong line of type under the photo, which is reproduced above, the gentleman's name being J. F. L. Carron, Montreal.

Mr. Carron is the heating expert of one of the largest supply houses in the Dominion and is very much interested in fuel conservation as is shown by the arguments put forth in the article referred to.

Editor.

TORONTO'S NEW FILTRATION PLANT IS BEING TAKEN OVER, COMPLETED

The mechanical filtration plant at the Island, which was commenced in the Summer of 1914, and completed several months ago, is to be formally taken over by the city within a few days. It is said to be one of the most efficient types in use and has cost the city of Toronto $1,096,277.

The filters are known as the Ransome Drifting Sand Filter, in which is employed a gradually moving body of sand as the primary or roughing filtration medium. This eliminates in a continual process the main impurities from the water prior to its passage through the final filtration medium or stationary sand. The moving sand gravitates grain by grain towards a system of collecting or abstracting points at the bottom of the filter arranged in a system so as to divide the filter into thirty equal sections. The sand with added water then passes into the central collecting point and is elevated to a sand washer placed centrally at the top of the filter, where, after being cleansed of impurities, it is continually caught up by incoming water and deposited again on the moving sand surface at the top of the filter. The stationary sand forms naturally into pyramids with rounded tops offering a large surface to the passage of the filtering water. This surface is more than twice the plan area of the filter. The stationary sand rests upon gravel from which it is separated by perforated brass screens, and the water is collected from a number of collecting pipes from the bottom of each of the thirty sections.

CONDITIONS IMPROVING OUT WEST

A representative of a certain supply house recently said that during his journeys throught British Columbia, Manitoba, Saskatchewan, Alberta and Northwestern Ontario he found that business is in a much healthier state than was the case last year at that time.

Many of the trade are paying off their accounts slowly but very surely and are not involving themselves further. He referred to the fact that a large number are paying more attention to the bookkeeping end of their business. Many have adopted a practical re-sale price system which is working wonders. This is very encouraging and no doubt means a brighter outlook for all concerned.

A NEW BOOK ON SHEET METAL WORK

Sheet Metal Workers' Manual by Broemel, is the title of a new book just off the press. It is of handy size and is a complete, practical instruction book on the sheet metal industry. It describes how to develop all manner of sheet metal patterns, and explains the use of all kinds of tools and machinery, in connection with the oxy-acetylene welding and cutting process, lead burning, brazing, and pipe bending. It comprises also a course in elementary and advanced sheet metal work in general, including just such geometrical problems as are of use to sheet metal workers. The book is full of new and novel information, and should prove of value not only to the "old timer" but to every apprentice in the sheet metal, tinsmithing and plumbing trade. It contains over 550 pages and is profusely illustrated. Further particulars may be procured from the publishers, Frederick J. Drake Co., Chicago, or from MacLean Publishing Co., University Ave., Toronto, book department.

INTERESTING AMALGAMATION IN VICTORIA, B.C.

So as to undertake all manner of ships' plumbing construction in as efficient and practical a way as possible the following firms, all of whom were previously in the plumbing business, have amalgamated their businesses:

Andrew Sheret.
J. R. Nott Co.
Haywood & Dods.
Colbert Plumbing Co.
W. R. Menzie & Co.

The new concern will be known as the Vancouver Island Marine Plumbing Co. We are informed that the new concern have procured tenders to instal the plumbing and sanitary work for twelve ships that are now under construction.

PROCURED SOME NICE SHIPS' PLUMBING CONTRACTS

Barr and Anderson, sanitary and heating engineers, Vancouver, B.C., have procured several contracts to instal the plumbing in a number of ships now under construction.

Dare You Measure Your Efficiency?

Do You Know Your Weaknesses and Needs in Your Work and Life

SOME advertising men were on the way to a convention. To pass the hours on the train they tested themselves by a set of questions, each rating himself privately and announcing only the result. They were all pretty able men, but they allowed themselves only an average of 30 per cent., according to one of the party who reported the incident for Printers' Ink. Here are some of the questions. How do you rate?

Do you like your work?

Have you learned the best, quickest, and easiest way of doing it?

Are you thoroughly informed on "scientific management?"

Do you know where your greatest power lies?

Have you fixed a goal, in the line with your supreme talent?

Have you learned how to get well and keep well?

Can you be optimistic under all circumstances?

Do you realize which of your habits, thoughts, or emotions make you efficient?

Are you correcting your known weaknesses—mental, financial, social or spiritual?

Do you breathe deeply and hold an erect posture?

Are you independent, fearless, positive?

Are you tactful, cautious, courteous?

Have you secured the best possible advisers and associates?

Do you wish your rivals well and never speak ill of them?

Do you work harder than anybody else in the business?

Have you learned the science of planning your day ahead?

Can you relax entirely in your leisure hours?

Are you saving money systematically?

Do you enjoy art, music, literature, and the presence of little children?

Does your highest ambition include some real services to humanity?

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Keep your temper, gentle sir,
Writes the manufacturer,
Though your goods are overdue
For a month, or maybe two,
We can't help it, please don't swear,
Labor's scarce and needles rare,
Can't get pig iron, lead or brass,
These are facts—'tis true, alas!
Harry's drafted, so is Bill,
All our work is now up-hill,
So your order, we're afraid,
May be still a bit delayed.
Still you'll get it, don't be vexed,
Baybe this month, maybe next;
Keep on hoping, don't say die,
You will get it by and by.

—Courtesy Chas. Miller & Son Co.

HOW TO DEVELOP FURNACE BOOT

Continued from page 17

by drawing the slant lines shown, and repeating the operations by transferring all the measurements as has been done from Fig. 3 except that the measurements must be transferred in the order shown following from 7 to 6, 5, 4, etc.

Having cut all the arcs again, connect points 7, 6, 5, 4, 3, 2, 1 to R; next, draw an arc from R to S the distance being the same as from N to O. To determine the distance between S and T 1, place the compass at A and open to B in Fig. 2, this being the true length of the metal at the slant height of the boot It will be seen that the distance between O R, Fig. 5, is equal to H, a, Fig. 2, and that R S and N O equals the half of front and back of rectangle portion shown at A C and D B in Fig. 1. The curved line P T in Fig. 5 equals the true length of half the round end.

By turning the half pattern over at N P and allowing for seam at S T the seam will come at front of boot.

The stranger on a walking tour came across an "old, old man a-sitting on a gate" and began to ask questions:—

"You are a farmer, I suppose?"

"No, not now. I used to be, but I gave it up."

"Well, you don't seem to be very busy. You have plenty of time on your hands, haven't you?"

"Lots of it."

"Ever do any work?"

"Once I did."

"What do you do now, if I may ask?"

"Don't do nothing. Hain't done nothing for nearly ten years."

"So. Why. you're in luck. If I did nothing for half that length of time I should be in the poorhouse."

The old man's face beamed with a glad surprise, and then, as one who knows his rare good fortune and values it at its just worth, he cried delightedly: "That's where I be!"

WINNIPEG PLUMBING DIVISION

Permits issued and work done by above dept. during the month of June.

133

Inspections

Water Tests	Smoke Tests	Subsequent Inspections	Miscellaneous Inspections	Defects Rectified
45	140	311	19	210

Sewer Division

Permits issued	Connections constructed	Inspections
27	11	65

Sewer Flushing

Tank Flushings Gallons	Hose Flushings Gallons	Total Gallons of Water
622,080	430,625	1,052,705



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

WHO HANDLES AIR LIFT PUMPS?

Editor Sanitary Engineer: We have been very much interested in the articles describing air lift pumps in SANITARY ENGINEER and would like to know where these appliances can be procured in Canada and any other information regarding same.—N. O.

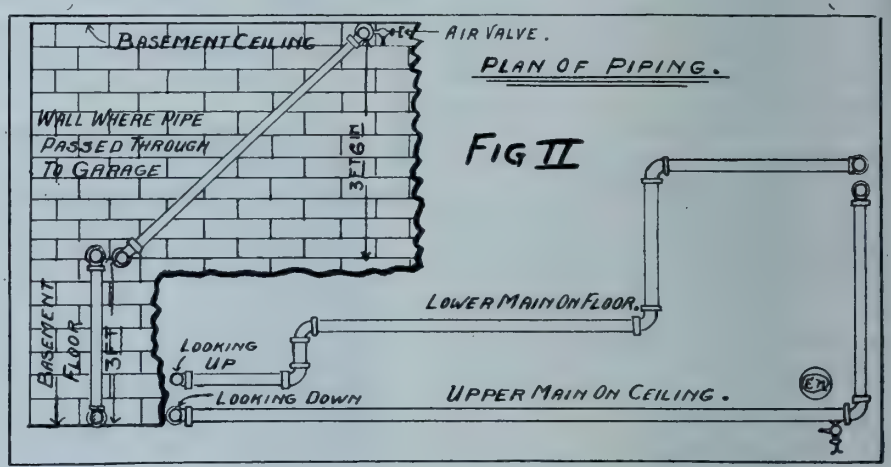
The only firm that we know of who handle this line are the Canadian Ingersoll Rand Co., Sherbrooke, Quebec. Ask for Bulletin No. 14; it contains some very interesting information which every sanitary engineer should have at hand for ready reference.—Editor.

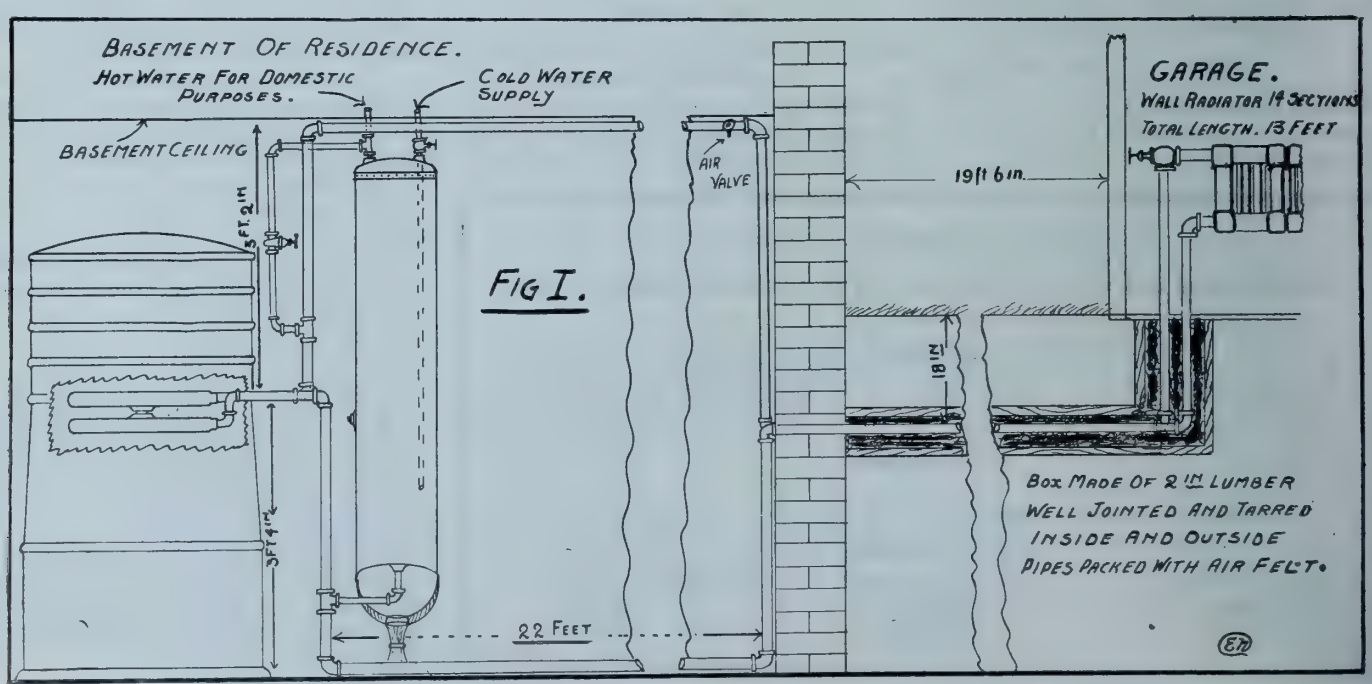
HOT WATER HEATING FOR GARAGE

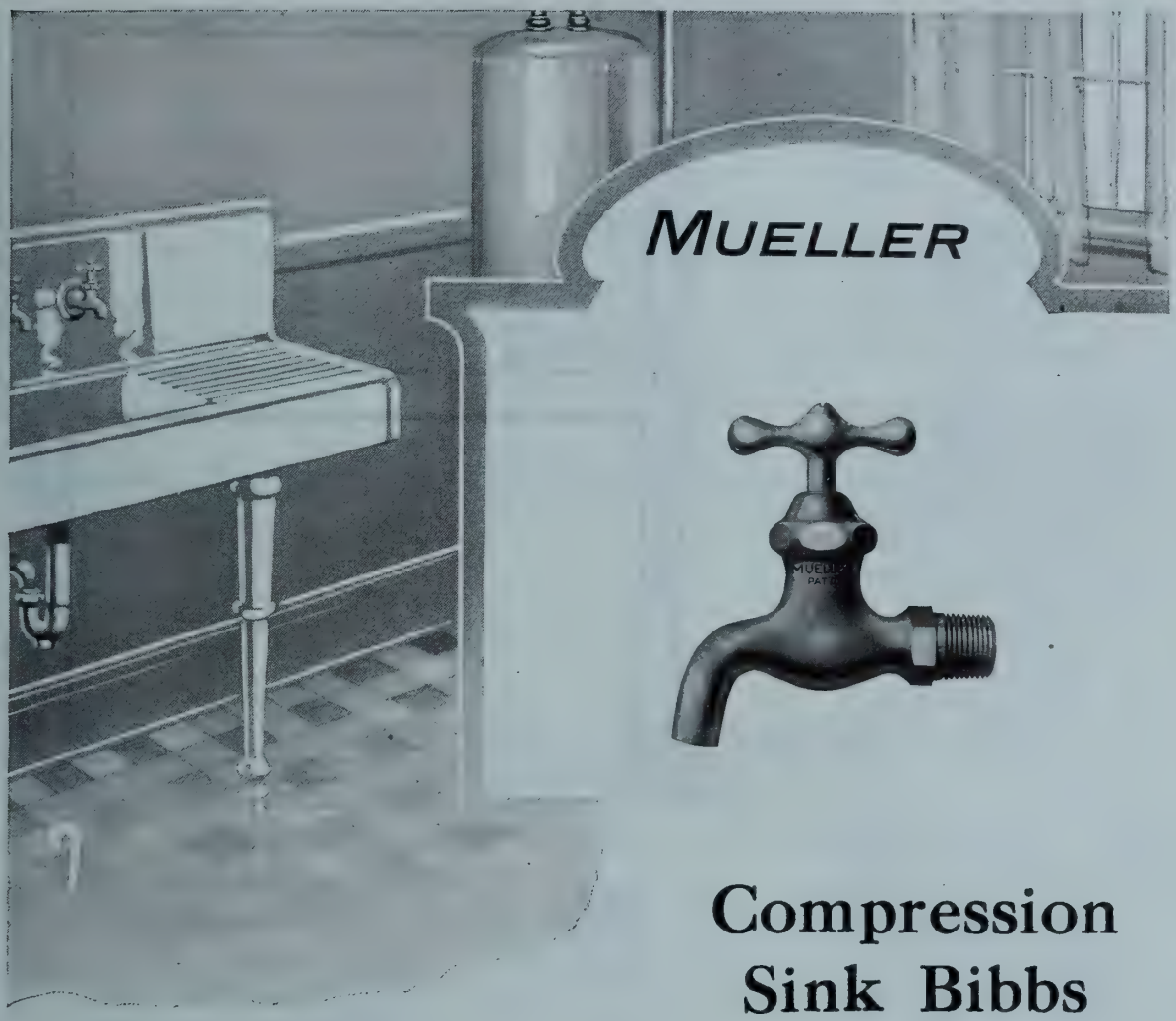
Editor Sanitary Engineer: A customer of mine built a house just before the war and had a furnace installed about two sizes larger than necessary. He intended to build a conservatory later on and heat it with the same furnace. However, that is now out of the question and he has built a garage. He wants to heat the garage from a domestic coil now in the furnace that is at present connected to a range boiler. Would it be possible to heat a large radiator in the garage as well as the present range boiler? He claims that the water in the boiler gets very hot and is of the opinion that there is enough surplus heat in the boiler to heat the garage.

Another difficulty, too, is that there are one or two doors in the way and on account of the ground level being lower than the doors or the ceiling, I do

(Continued on page 30.)







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QUESTION BOX

Continued from page 28

not quite see how the piping can be installed unless there is a trap in them at the point where the pipes go underground and through the wall to the garage. Any information will be very much appreciated, hoping you can solve me this problem, as it will be a very interesting job if it will work when completed.—A. R. R.

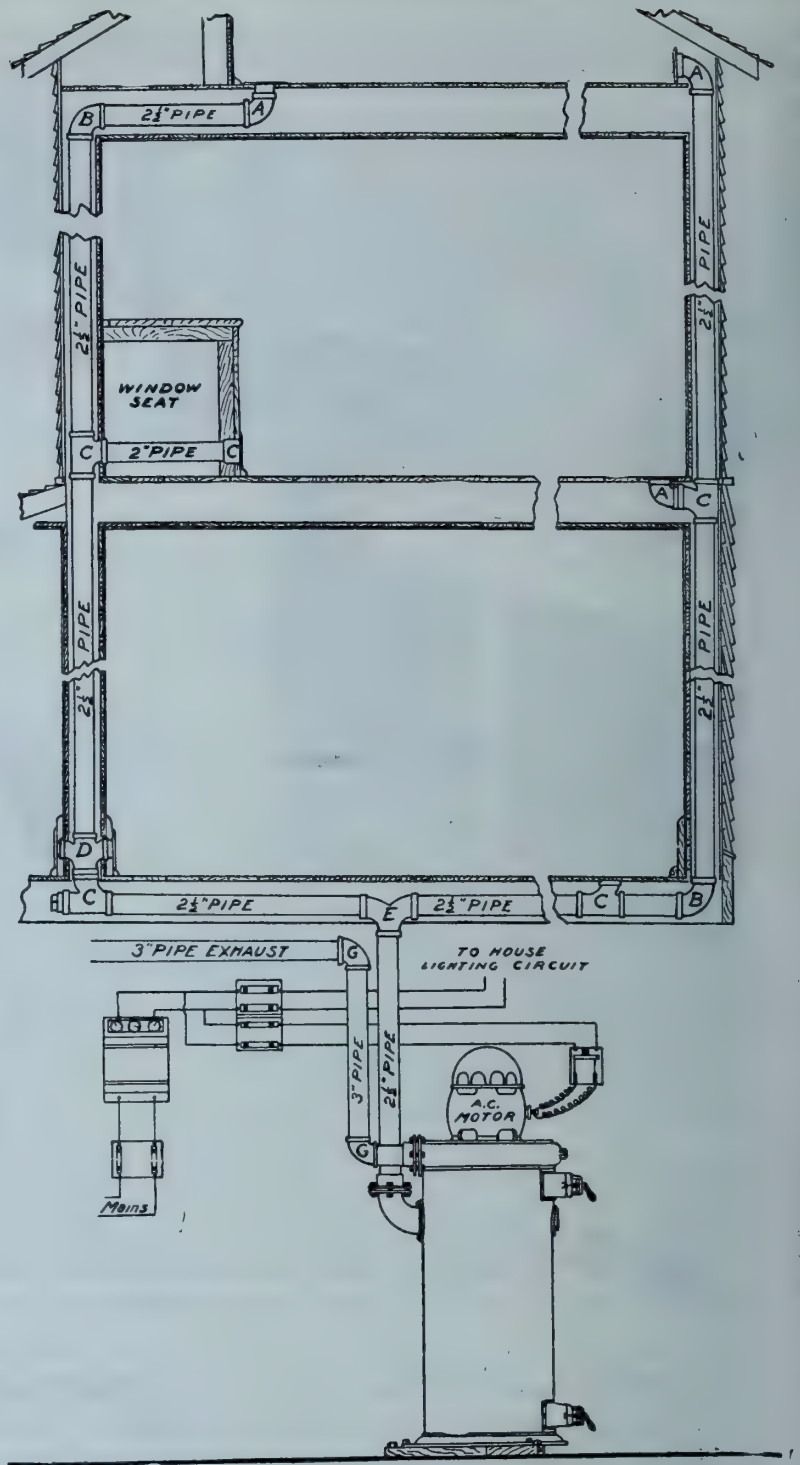
A very similar question was asked some two or three years ago and the writer was asked to look over the actual job. Several fitters took on the work, but after a while they threw it up as they had their doubts as to its practicability.

Figs. 1 and 2 show exactly how the job was installed. In the first place two coils were connected together as shown, and all the pipes used were 1-inch except the loop with the valve on which enters the top of the range and the one connected to the bottom of the range boiler. These are ¾-inch pipe.

The measurements in this job are shown which gives our readers the amount of trapping which resulted in having to drop at the basement wall so as to be low enough underground to be free from frost. It will be noted that there were 14 five-foot sections on the radiator, and that the valve is on the top of the radiator.

It might be well to explain the reason for putting a valve on the three-quarter that entered the top of the boiler. This was so that when the valve was set at a certain amount of opening the water would not be drawn from the coil but rather from the boiler. Also it will be seen that this valve, being partially closed, the heat would first ow to the radiator piping, always giving the garage the preference.

The installation worked fine and is doing so yet without the least reason for complaint.



HOW TO PIPE HOUSE FOR STATIONARY VACUUM CLEANER

Editor Sanitary Engineer: Some time ago I noted an article in your paper, SANITARY ENGINEER, which referred to the piping of a house for a stationary vacuum cleaner. I do not recall having seen the piping plan of such a system and would like to be given an idea of the size of piping and if there are any special kind of fittings to be used. Would it be possible to use galvanized sheet metal piping and elbows similar to those used for rain water leaders, providing the joints were made tight in some way or other.—A. S. E. R.

The accompanying sketch shows a typical piping plan for a stationary vacuum cleaner. The pipe sizes recommended are 2½ inches, and all fittings should be of the long sweep type. The T's are more in the nature of a long sweep drainage fitting and are generally recessed. In fact we believe drainage fittings would answer fairly well. All pipes should be reamed and any rough places in the piping removed. Regarding the use of sheet metal piping such as referred to by our inquirer, we believe that a good mechanic could make a good job of such kind of piping. But he would require to take great care that all joints were well fitted and tight. We would think that some kind of rubber cement and sleeve should be put over the slip joints, and the seams should all be well soldered.—Editor.

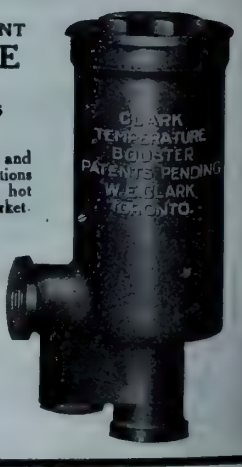
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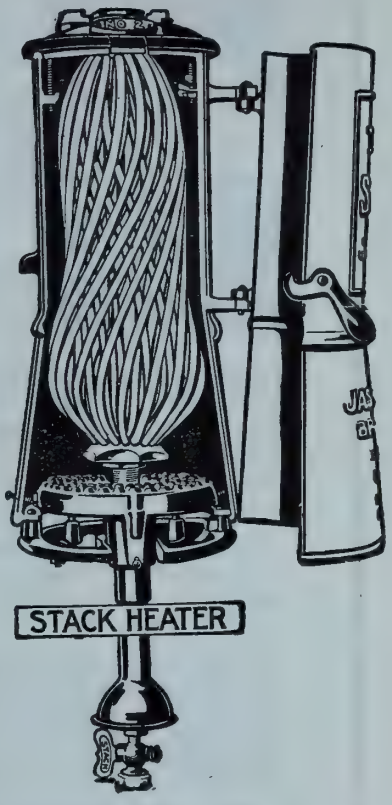
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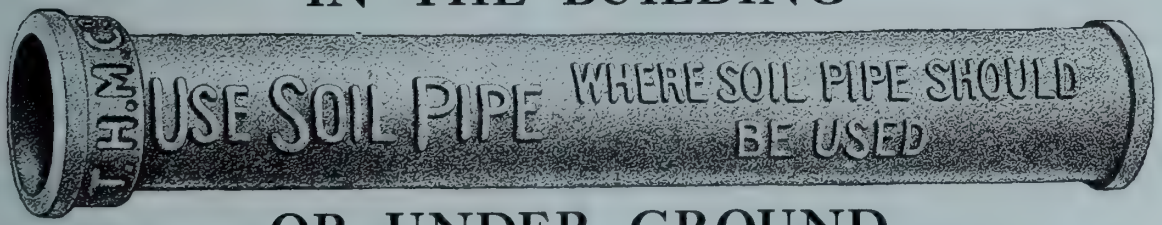
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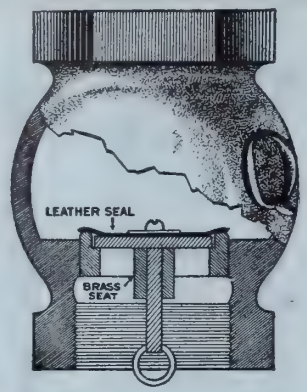


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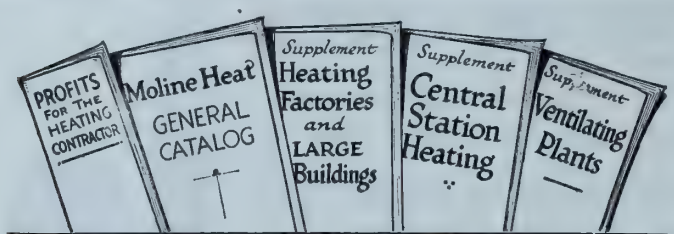
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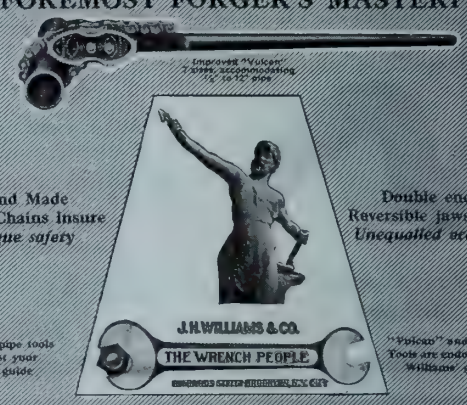
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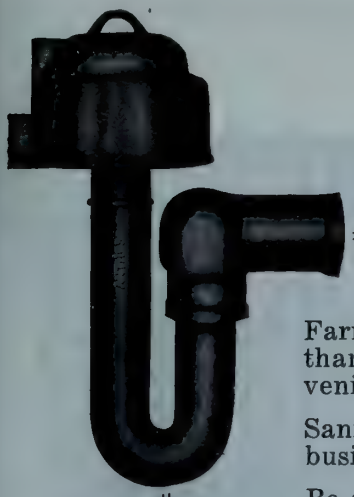
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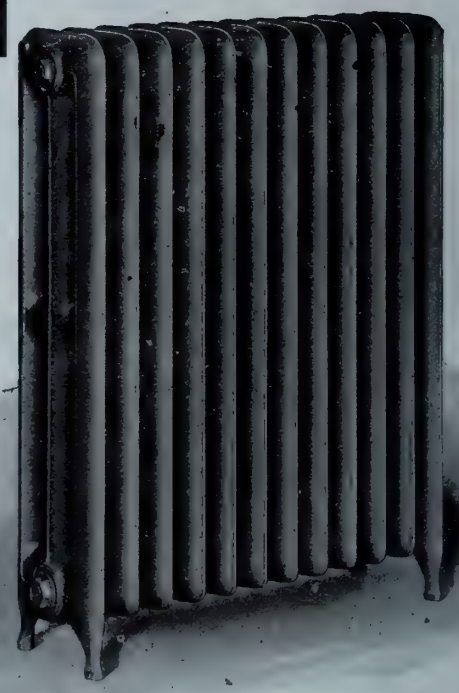
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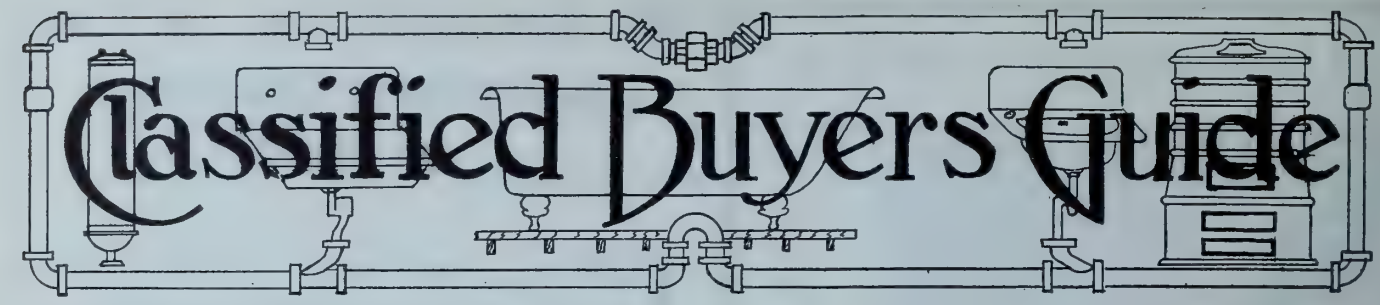
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H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
James Morrison Brass Mfg. Co., Ltd., Toronto.
Steel & Radiation, Ltd., Toronto.

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Empire Mfg. Co., London.

Gas Water Heaters.
Empire Mfg. Co., Ltd., London and Toronto.
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James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Pittsburg Water Heater Co., Toronto.
Rudd Manufacturing Co., Toronto.

Generators.
James Morrison Brass Mfg. Co., Ltd., Toronto.

Heaters.
Lord & Burnham Co., Toronto.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal and Toronto.

Lead.
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Hoyt Metal Co., Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

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Empire Mfg. Co., Ltd., London and Toronto.
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Trimont Mfg. Co., Roxbury, Mass.
G. & W. G. Gummer, Ltd., Rotherham, England.

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Packless Radiator Valves.
Kerr Engine Works, Walkerville.

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Beaton & Cadwell Mfg. Co., New Britain, Conn..
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Canadian Tube & Iron Co., Ltd., Montreal.
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Borden Canadian Co., Ltd., Toronto.
Trimont Mfg. Co., Roxbury, Mass.

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Empire Mfg. Co., Ltd., London and Toronto.
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H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Toronto Hardware Mfg. Co., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.
Warden King, Ltd., Montreal.

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John Hall & Sons, Ltd., Braniford.
A. B. Jardine & Co., Hespeler.

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Borden Canadian Co., Toronto.
Trimont Mfg. Co., Roxbury, Mass.

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Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
L. Wolff Manufacturing Co., Chicago.

Pumps.
C. A. Dunham Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Hurley Machine Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brassfounders & Engineers, Ltd. Cornbrook, Manchester, England.
R. MacDougall & Co., Ltd., Galt.

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Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.

Radiator Foot Rests.
Beaton & Cadwell Mfg. Co., New Britain, Conn..

Radiator Traps (Steam).
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C. A. Dunham Co., Ltd., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

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Toronto Hardware Mfg. Co., Toronto.

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Williams, J. H., & Co., Brooklyn, N.Y.

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C. A. Dunham Co., Ltd., Toronto.

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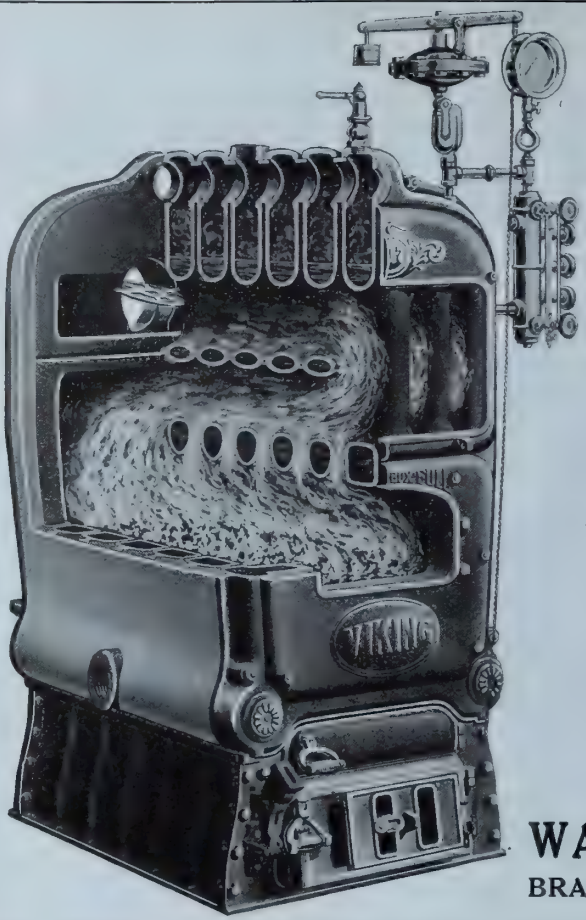
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Our "VIKING" BOILERS

For Steam or Hot Water

are giving great satisfaction in all parts of the Dominion.

Fitted with government regulation trimmings, ensuring safety. Every section is tested before leaving the factory.

Ample sized flow and return tappings ensure steady water level. They are easily regulated and kept clean.

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BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES Black and Galvanized All Sizes

Ask your jobber for CT Brand

CANADIAN TUBE & IRON CO., LIMITED

Montreal Works: Lachine, Can.

PIPE AND THE PUBLIC WELFARE

By R. C. McWANE

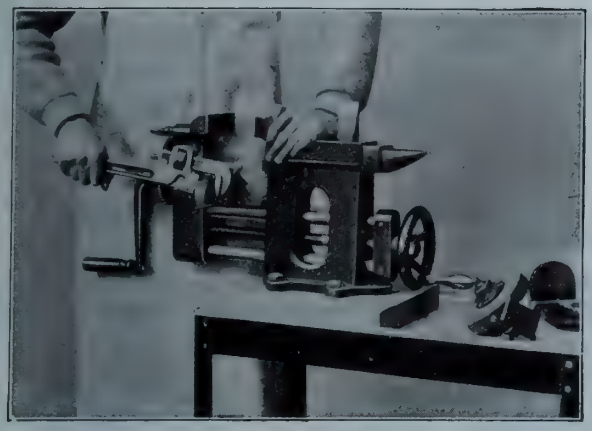
A Book Just Off the Press

Every sanitary engineer should be the possessor of this book. It deals with pipe-making of all kinds, cast iron, wrought iron, steel, wood and tile pipe. It is valuable because it gives the users of pipe a true idea of how pipe lasts under various conditions when in service.

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Stewart Handy Worker
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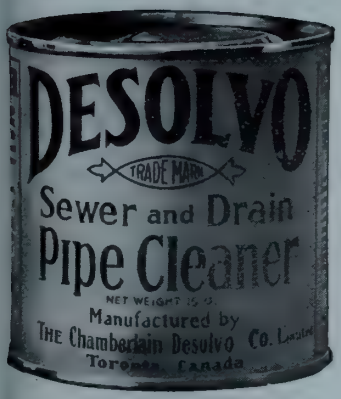
The Equipment Comprises——

A Pipe Vise
A Bench Vise
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A Two-Speed Drill
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It's not a toy. It's a real combination of practical tools for practical people.

Write for full particulars.

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Desolvo will break through!

Gets Hot with Cold Water Try it!

Users claim that DESOLVO is the most up-to-date, efficient and quickest in clearing choked drains, waste and soil pipes, etc.

We modestly claim that DESOLVO does all you expect it to do—and more.

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Write to-day on your letterhead for a can —at our expense.

All you need do is Mention Your Jobber's Name.

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There are two profits in this Radiator trap for you.

THE next time you make up an estimate on a two-pipe heating system you can figure on two profits by using Johns-Manville Radiator Traps—one profit on the sale and one on the installation.

There is no danger of your having to sacrifice your sale profit for we protect you there.

And the radiator trap itself protects your installation profit for its simplicity makes it the fastest trap to install. And once installed there are never any call-backs for it is self-adjusting and tinker-proof. Ask any branch for booklet and prices.

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COVERS THE CONTINENT

Johns-Manville Radiator Trap





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One Man Can Thread up to 12 Inch.

You cannot afford to expect your men to make horses of themselves. If they did they could not keep it up. Our tools save time, do better work and makes life worth living for your men.



Cuts Without Burring

No. 1 cuts from ⅛″ to 1″
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To call your attention to the Famous B & C Floor and Ceiling Plates.
Our No. 15 style narrow flange designed for the Canadian trade.

One of many styles



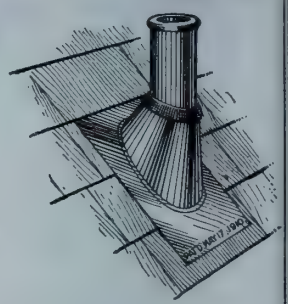
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Handsomely nickel-plated or plain Sizes ½ to 2″

Stock now carried by our Canadian Representative
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The SIMPLEX Adjustable Roof Flange

Fits any roof from ½ pitch to flat—just slide it down the pipe and it will conform with the pitch of the roof.



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Second-Hand Pipe

1-2″ to 4″

Black and Galvanized

Send us list of your requirements

Consumers Metal Company, Limited
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Works: LACHINE, QUE.

"HAUSE" PIPE JOINT CEMENT

For steam, water, air, oil, gas, gaskets, etc. The cement that cements. Sets like gum. Allows no leaks.

The Great Value of "HAUSE PIPE JOINT CEMENT" lies in its peculiar chemical properties which permits of its hardening and expanding after the joints are made up. In making up joints it has the same effect as a lubricant on the best graphite, and while the joints may be made and broken readily, a perfectly tight joint is maintained at all times. Comes in 1-lb., 5-lb., 15-lb., 25-lb., 50-lb. cans, 100-lb. barrels. Manufactured in ready mixed and powder form. Ask your jobber for prices, or write us direct.



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Made in Omaha, Neb., U.S.A., by

Chas. F. Hause Mfg. Co., Inc., Omaha, Neb.

THE BICALKY

It's a real little wind engine



VENTILATOR

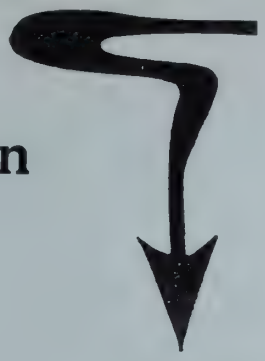
Is a positive suction fan that ventilates

The "Bicalky" will dispense with all auxiliary heaters on local ventilation systems.

It is, as far as we know, the most scientifically constructed, self-propelled fan ventilator on the market.

Write us for full particulars.

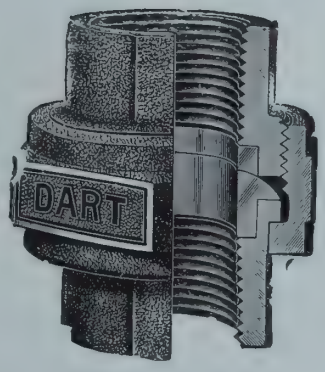
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Easy Connection Regardless of Alignment

Because of length of service rendered and their easy connection regardless of alignment, Dart Unions afford the purchaser a decided saving in money and time.



Dart Unions are "Bronze to Bronze" at the joint—rust-resisting insurance against pipe troubles.

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MADE IN CANADA.

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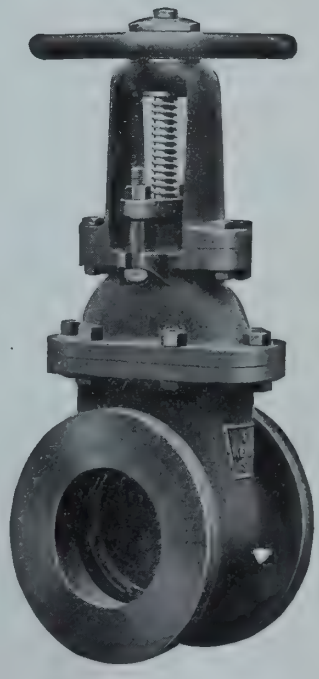
There Are Lots of Gate Valves

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but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.

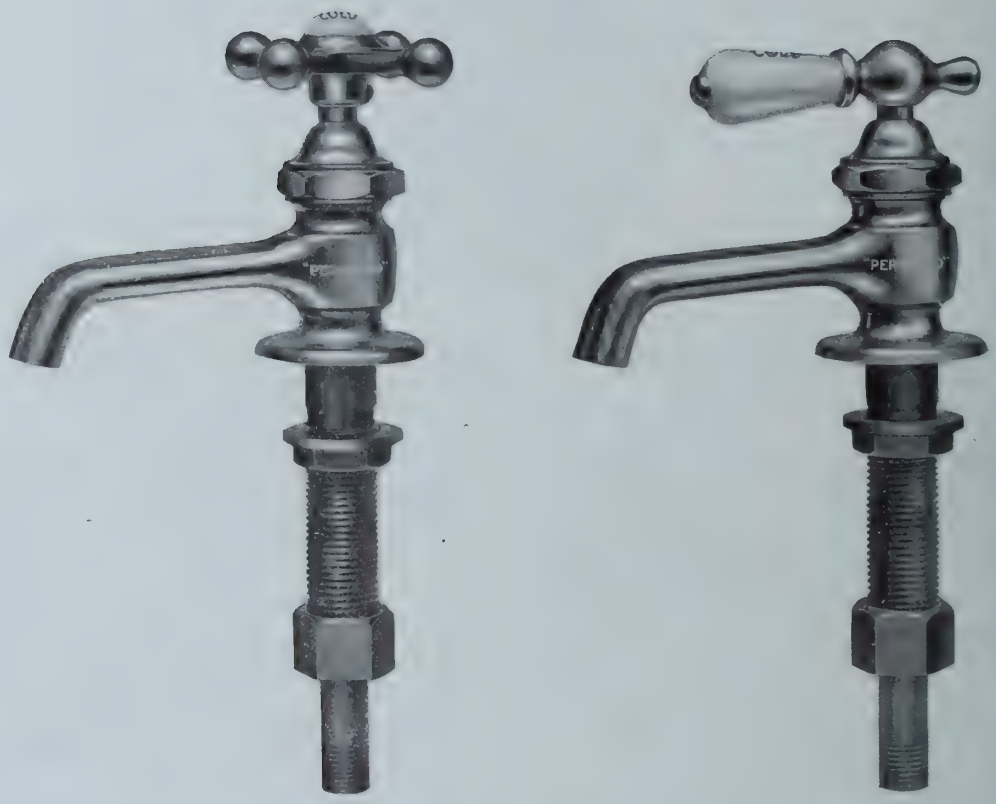
Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.

Approved by the Fire Underwriters' Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario

Registered **PERFECTO** *Trade Mark*

A LINE OF BRASS GOODS
THAT CAN'T BE BEATEN



When you buy "Perfecto" Brass Goods you do more than buy "Brass Goods," you buy service, you buy satisfaction and durability.

All this you give to your customer, and pay no more than you would for less "perfect" goods, and we stand behind every piece, which means extra protection for both you and your customer.

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Any article of our make proving defective through inferior metal, or improper workmanship, on our part, will be replaced with TWO good ones, at NO CHARGE to you.

CAN YOU BEAT IT?

Galt Brass Company, Limited
Galt, Canada

SEE PAGES 20 AND 21. BIGGER BUSINESS BUILDERS No. 1.

SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

Vol. XII. Publication Office, Toronto, Aug. 1st, 1918 No. 15

SPECIALIZE ON SHOWERS

"EVERY SHOWER'S A BLESSING"

BUT *EMPIRE* SHOWERS BEAT ALL

WHAT WE SAY

This is a very opportune time to specialize on showers. There is no fixture in a home that would be appreciated these hot days as would a portable shower, and no fixture adds class to a bathroom more than does a shower fixture. No bath tub is complete without a shower.

Every Sanitary Engineer should boost the sales of these fixtures for more reasons than one.

First: Because a shower is necessary all the year round. Second: Because such a fixture completes the average bathroom, and third, because of the fact that no amount of bathing in a bath tub will fill the requirements of the shower.



WHAT A MEDICAL AUTHORITY ONCE SAID

At a meeting of Medical Health Officers, held some time ago, one of them was asked to express his views about plumbing and plumbing fixtures and their relationship to health. He declared that the bath tub was the worst abomination in a home unless fitted with a shower. He further stated that when a person took a bath in the regular way, and no shower was available, that that person would be no cleaner than the water in the bath tub. This same gentleman brought pressure to bear upon a number of men which resulted in a certain club building being equipped entirely with showers only.

Empire Manufacturing Company Limited

LONDON TORONTO

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While



A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for BEAVER BRAND CAST IRON ENAMEL WARE

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Monarch Brass Mfg. Co., 71 Brown St., Toronto

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DOMINION
RUBBER SYSTEM
AND ASSOCIATED COMPANIES

You cannot be reminded too often that this symbol represents the best there is to be had in rubber goods. It is distinctive of honest worth and merit in the rubber article to which it is attached. Behind it is the guarantee of the oldest and largest rubber manufacturing organization in Canada.

No matter what your rubber need may be, it can be supplied to the best advantage through the Dominion Rubber System. Our experts are at your service to give advice and to show you how to get the best results in the use of rubber as applied to your particular need.

The service of a Dominion Rubber System expert is free to those who will write our nearest branch.

Canadian Consolidated Rubber Co., Limited

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Handy as a Pocket in a Shirt

Wolverine Assortment Compression Repairs—

Including Bibb Repairs, Seat Caps, Screws, Bolts, Nuts, Washers, etc.

You cannot afford to be without this assortment on repair jobs. It pays for itself on the first job.



For repairing compression work of any nature, Bibbs, Bath Cocks, etc., made good as new with this assortment No. 3110.

Canadian Chatham Wolverine Company, Ltd. Ontario

PIPE THREADING TOOLS

This Tool Paid For Itself On One Job!

Here is a case where, with an ordinary tool, the whole pipe line would have had to be taken down. And this is only one of many similar instances.



"Toledo" Geared Adjustable Threading Tool No. 2 making a cut and thread on a 4-inch bend in position. It was desired to install a steam separator above throttle of engine, and the whole job was satisfactorily completed without removing the pipe line.

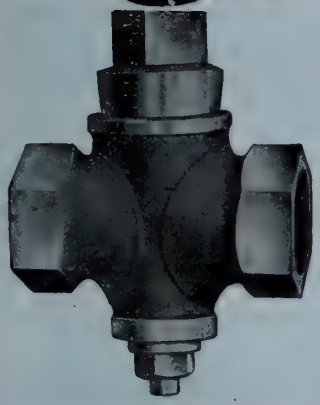
"Jardine" and "Toledo" Pipe Threading Tools cut clean, sharp threads with a minimum of muscular effort.

They permit of one man doing work which ordinarily requires two.

A. B. JARDINE & CO., LIMITED, HESPELER, ONT.

Sole makers of "Jardine" Pipe-Threading Tools.
Sole licensees to manufacture and sell Toledo Pipe-Threading Tools in Canada.
Agents, Winnipeg and West—Stanley Brock, Ltd., Winnipeg, Man.
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FIVE WORKS—OVER 3,000 EMPLOYEES

It is our intention after the War to devote our energies to the intensive production of the following Specialities:

Gunmetal and Brass Valves and Cocks.
Steam, Water and Compressed Air Fittings generally.
Cast Iron Stop and Sluice Valves.
Semi-Rotary Pumps.
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Brass Bolts and Nuts, Studs and General Turned Work from the Bar
Cast and Malleable Iron Cocks and Pipe Fittings.
Pressure and Vacuum Gauges.
Injectors, Engine Governors.
Spraying Machinery.
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"Stella" Brand Alloys, Manganese Copper, Silicon Copper, Ferro Zinc, Phosphor Copper and Tin, etc.

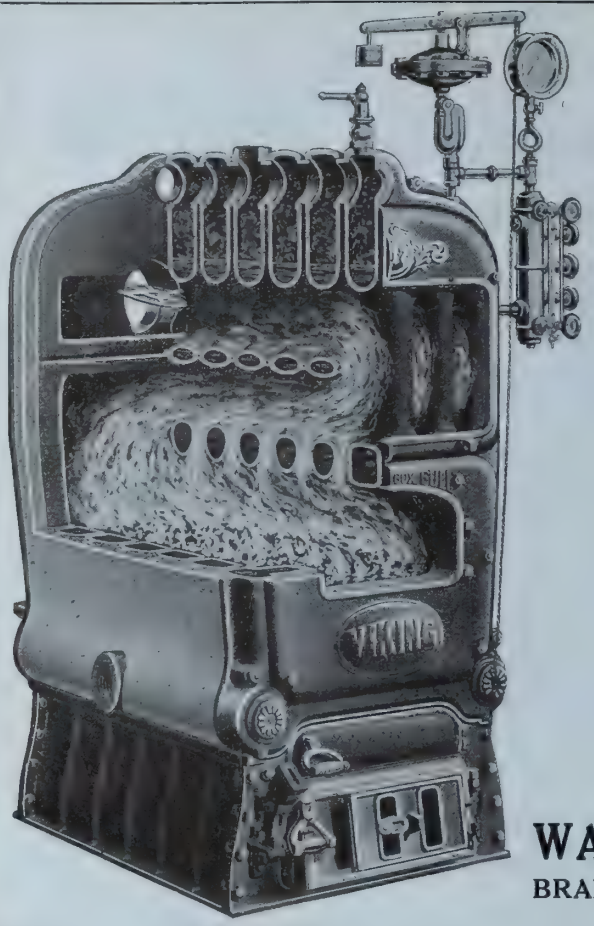
Business After the War

If you are interested in any or all of the lines mentioned and are in a position to take a hand in the energetic distribution of the same, please communicate with us NOW to our Head Office at the address below.

UNITED BRASSFOUNDERS and ENGINEERS, Limited

EMPRESS FOUNDRY

Cornbrook, Manchester, England



Just Look at the Fire Travel

Our "VIKING" BOILERS

For Steam or Hot Water

are giving great satisfaction in all parts of the Dominion.

Fitted with government regulation trimmings, ensuring safety. Every section is tested before leaving the factory.

Ample sized flow and return tappings ensure steady water level. They are easily regulated and kept clean.

WARDEN KING, LIMITED, MONTREAL

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Pipe Fittings

Made in Canada



M Brand Pipe Fittings, etc., give a service and satisfaction that will invariably get you re-orders and much new business as well.

A trial of the goods will prove this claim.

CAST IRON FITTINGS

With this brand mean fittings made with iron of high tensile strength—proper proportions and correct tappings.

RECESSED DRAINAGE FITTINGS

MALLEABLE FITTINGS

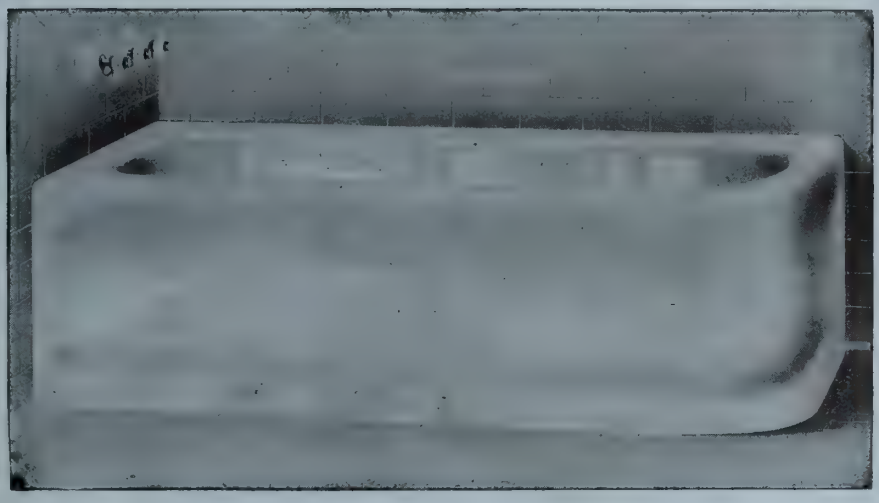
With this brand mean fittings made of Air Furnace Refined Iron, reamed and tapped to gauge with perfect threads.

Standard and Extra Heavy Flanged Fittings and Flanges. Galvanizing Malleable and Gray Iron Castings of all Kinds.

International Malleable Iron Co., Limited, Guelph, Ontario, Canada

"Standard"
"Perfection" Built-In Baths

Made in One Piece Enamelled All Over



These Baths represent the last word in design and finish, and are made to build into Right or Left Hand Corner or into a Recess.

The "Perfection" Built-in Bath is only 17½ inches high, therefore convenient. It builds into walls and floors, the absence of all dust-collecting cracks and corners, meaning bathroom sanitation.

Made in 5 and 5½ foot sizes.

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THE CANADA METAL CO., LIMITED

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You'll find Canada Metal Products wherever progress is a "by-word." With consumer and dealer alike, Canada Metal Products are within the charmed circle of Bigger Business Products.

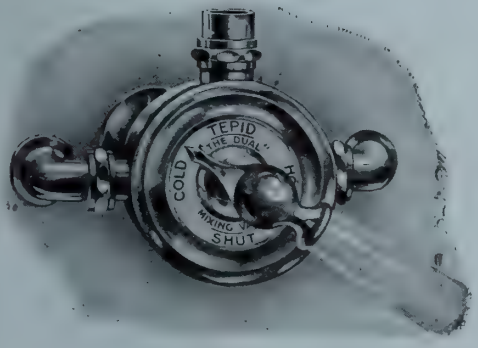
EVERYTHING FOR THE PLUMBER

BATHS, LAVATORIES, SINKS, ARISTOCRAT LAUNDRY TUBS, LEAD PIPE, SOLDER, BLOCK LEAD, SHEET LEAD, Etc.

G. & W. G. GUMMER, LIMITED

EFFINGHAM BRASS WORKS,
ROTHERHAM,
ENGLAND

And at
9 Fenchurch St.,
London



"Dual" Mixer

A valve that really mixes Hot and Cold Water, and maintains a uniform mixture.

For ease of operation, simple construction and easy installation, it has set a new standard of efficiency.

Cold Water must be turned on first, no possibility of scalding.

Made in several forms for Showers, Sprays, Operating Rooms, etc.

At the well-known works of Messrs. Brunner, Mond & Co. these valves provide baths for 2,500 employees.



G. & W. G. GUMMER, LIMITED

Manufacturers of every description of

Engineers,' Plumbers' and Sanitary Quality Brassware

Is The Plumber A Robber?



CERTAINLY NOT—in fact investigations have proven that as a general thing the average Sanitary Engineer does not charge enough for his goods and services, nevertheless many people, when they receive their bill, think that they are paying 100 and 200 per cent. profit.

Who is to Blame for This Condition?

It seems a bold statement to make but we believe the Sanitary Engineer is to blame to some extent, AND HERE'S THE REASON:—

Because He has had no Businesslike System of Charging.

The average Sanitary Engineer as a rule guesses at prices when he is making out a customer's bill, and if the customer comes back with a complaint (they generally do), he hasn't a real answer, he simply stands there and tells the customer the charge is right. Would it not be more businesslike if he had a printed PRICE LIST that he could produce and show where every article on the bill was properly priced according to the same list that is being used all over Canada?

Get in line. Adopt the Henderson Business Service. The cost is only about 70 cents per week.

The Henderson Business Service, Box 123, Brantford, Ont.

Joseph Breeden & Co., Ltd.

NEW MILL WORKS

Fazeley Street, Birmingham, England



MANUFACTURERS OF

HIGH CLASS

Steam and Water Fittings



The Quickest, Cheapest and Most Sanitary Way To Remove Obstruction!

To move any obstruction in drain pipes, whether caused by frost or an accumulation of foreign matter, is to mix a little Desolvo in cold water and pour down the pipe.

The process is just as simple as it sounds, and just as effective as it is simple.

Drop a line on your own letterhead, giving the name of your jobber, and we will send you a trial can absolutely free. You will then see just what Desolvo can do.

Chamberlain Desolvo Co., Limited

110 Church Street

TORONTO

GENERAL OFFICES, PITTSBURGH, PA.





QUALITY—EFFICIENCY and SERVICE

Eleven Years Ago We Introduced High Grade Plumbers Brass Goods into Canada

4 Years Later B.O.T. Products

TRADE B.O.T. MARK

Came into the Canadian Market.

Every Sanitary Engineer knows that the introduction of these lines has been a step towards his goal—Practical service.

WHATEVER YOUR IDEA IS REGARDING BUILDING BIGGER BUSINESS

At least start right by using quality goods backed by a reputation and a trade mark.

CANADIAN BRASS COMPANY, LIMITED

GALT TORONTO

Success and Your Associates

ALWAYS associate with men who are earning more money than you are. Such is the advice given by a man whose name is known the world over for his own success and the business which he created. It is good advice of a certainty, but we are not urging that it is the best advice. At the same time it is wise to associate with better or bigger men than you are yourself, because you are likely to be lifted up to their levels.

Most of us would probably like to be the intimates of J. P. Morgan, or of John D, or of Charlie Schwab, or Canny Andrew. If we had a speaking acquaintance with John Wanamaker, or Lord Beaverbrook, or Lord Shaughnessy, and with other distinguished and successful men, we would take comfort from the fact.

And most of us would feel rather small and uncomfortable if we were placed beside President Woodrow Wilson at a dinner table, or beside Sir Robert Borden, Sir Herbert Holt or Sir Wm. Mackenzie. And the reason would probably be that we know so little of the knowledge that really counts. If these successful business men engaged us in conversation we would probably find ourselves knowing very little about the things that matter.

This will illustrate the point:

Here's a true story. A Toronto manufacturer found himself on a train going to Albany in company with a number of distinguished Americans about to attend the inaugural ceremonies of a State Governor. A washout led to a delay, and the Canadian was thrown into close association with senators and congressmen and prominent lawyers. They bantered the little Canadian about Canada. He had the pluck of a bigger man. He had been a constant reader of THE FINANCIAL POST, and had absorbed many facts about Canada. He surprised his American traveling companions with his positive, well-informed and wide knowledge of Canada. When the company reached Albany, the Canadian was persuaded to attend the ceremonies, and was introduced as the man who knew all about Canada. The Governor was interested in Canada, and said so, and the little Canadian found himself telling the story of Canada very ardently to a very attentive listener, much to the amusement of his friends who introduced him.

This man made a hit on that journey, and many friends. One of the company gave him a stock market tip worth a fortune.

The point of this story is: You, as a Canadian, can make yourself informed very fully and intelligently if you become a regular reader of THE FINANCIAL POST. You can make yourself a worthy companion and intimate of presidents and magnates. The world likes to listen to men who know something well, and who can talk interestingly and informingly on the subject of their study.

You can become worth listening to if you know your Canada well. And you can get the kind and amount of knowledge concerning Canada which will make you interesting to others if you will read THE FINANCIAL POST regularly each week.

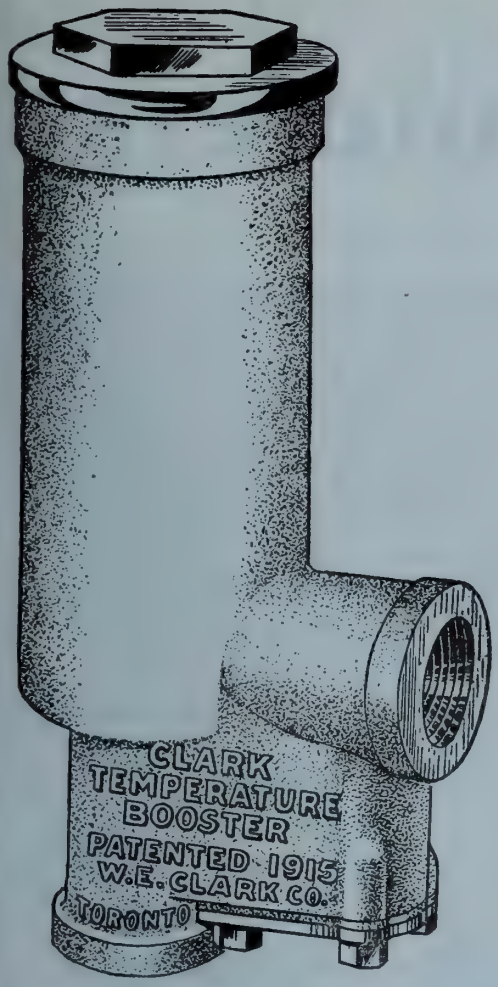
IF you read THE FINANCIAL POST REGULARLY you will find yourself keeping company with the highest paid staff of editors engaged on any publication in Canada—trained men who know how to make others know what they know and learn.

You will find yourself living in a most interesting world—the great, throbbing world of business. You will have your thoughts tremendously stimulated and helpfully directed. You will find yourself becoming a fit table companion for big men — this because you will have knowledge of a quality that will keep you from shame.

What is it that keeps you and THE POST separated? It cannot be its subscription price of $3. Probably it is because you are not very well acquainted with this paper.

We are going to put it to you this way: If you have the desire to be worthy of association with big men, then prepare yourself for such association by reading THE POST, and to make acquaintance easy, we provide the coupon below. It offers you THE POST for four months for a dollar bill.

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THE "CLARK" TEMPERATURE BOOSTER SAVES COAL

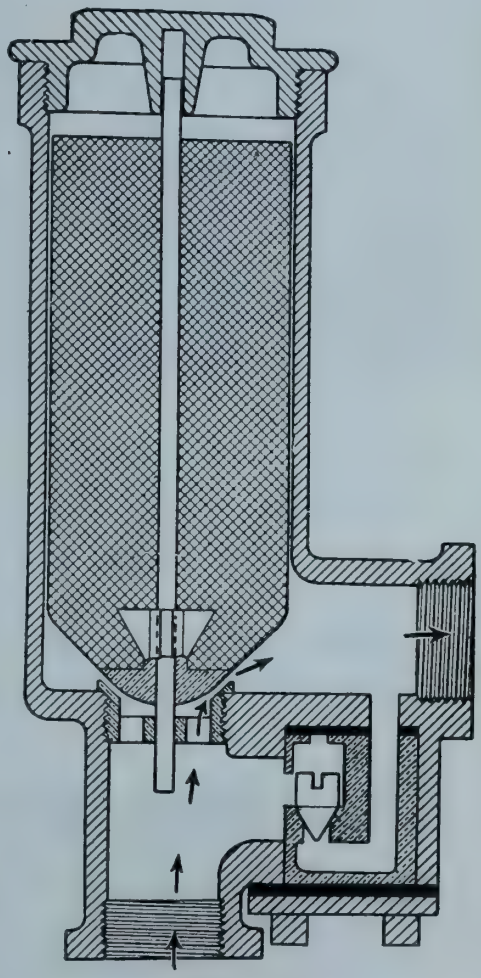
Now is the time to sell fuel saving devices. We know from past experience that the "Clark" booster will increase circulation, will increase the temperature and will, therefore, increase the efficiency of every hot water system to which it is installed.

You make good friends of every customer when you sell him a Clark booster, because you can save him some coal and increase the capacity of his heating system.

IT WILL BOOST YOUR PROFITS

Because it is easily installed and is fool-proof. You take no chances with the Clark Booster. We guarantee every one if installed according to our instructions. All you have to do is to insert the booster anywhere on the pipe line leading direct to the expansion tank.

The Clark booster is an all-brass apparatus. Nothing to get out of order. Ask us for prices, or write to your jobber.



SECTIONAL VIEW

Galt Brass Co., Limited

GALT - - CANADA

Peace Barometers

Peace may be a long way off or it may come suddenly, no man knows, but when you read in the papers that men of clear vision and large understanding are now studying conditions and are preparing a programme to take care of the trade which will come after the war, or the readjustment of conditions which must surely come, then it is time for everybody engaged in business to do their bit. There is such a thing as preparedness in peace as well as preparedness in war.

In this country the great war has hit the building business more than any other line, in addition it has interfered with the carrying on of those public works which are so essential to the welfare of the country. Every city and town in Canada is demanding more housing accommodation, and with the restoration of normal conditions there is bound to be a big building boom, and in addition operations on public works will be resumed.

The outlook is bright and the time is opportune for we who are engaged in the plumbing business or the manufacturers or distributors, to prepare for the trade that is to come. A "get-together" policy is necessary, confidence has to be restored and above all the public must be acquainted with the fact that the prices on the commodities which we handle, are not as high as they have been led to believe from newspapers and other interested sources. There is a great opportunity to do business. All that is necessary is co-operation between the manufacturer, the distributor and the plumbing contractor.

Our company is looking for a brighter and better future, and is looking for a bigger and better business by working hand in hand with the men who instal the goods, and supplying that class of plumbers' enamelware which will mean getting business for the plumber and satisfy the plumber's customers.

Port Hope Sanitary Mfg. Co., Limited

Factory:
PORT HOPE, ONTARIO

Head Office:
ROYAL BANK BUILDING, TORONTO

TORONTO SHOW ROOMS
119 King St. East

WINNIPEG OFFICE
405 Tribune Bldg.

MONTREAL SHOWROOMS
234 Beaver Hall Hill

SANITARY ENGINEER

VOL. XII. AUGUST 1, 1918. No. 15.



THE first sheet mill in Canada to operate successfully was installed a few months ago by the Steel Company of Canada, Ltd., at its Hamilton, Ont., plant. This is one of the most important developments in the iron and steel industry in Canada that has taken place in some time, and one that has been even more successful than the management anticipated. Until quite recently all black sheets used in Canada were imported from Great Britain or the United States. It was evident that there was room in Canada for a sheet mill if operated under practical conditions.

A few years ago a sheet mill was installed at Morrisburg, Ont., but for many reasons the proposition was not a success, and the plant lay idle for some time. Last year the Steel Company of Canada, seeing an opportunity for developing its activities and increasing its already wide range of products, purchased the plant at Morrisburg, and installed it, together with important additions, at Hamilton. The entire plant was removed to Hamilton, including mill, furnaces, machinery, and buildings. The plant as reconstructed is one of the most modern and up-to-date sheet mills on this continent. The first sheet was rolled on January 16, 1918, and galvanized the same day by the Dominion Sheet Metal Co., of Hamilton.

*Associate Editor Canadian Machinery.

Historical Sketch of Sheet Industry

To digress, a brief history of the steel sheet industry will be interesting as it shows its importance which is growing every year. The demand for steel sheets has increased to such an extent that the supply for some time has been short of requirements. The necessity of sheet iron or steel for so many products, not until more recent years made from this material, is becoming more and more apparent. The growing demand is due largely to the growing scarcity of lumber and also because of the fire resisting qualities of steel sheets. The variety of purposes for which steel sheets are used are too numerous to mention, the building, galvanizing and automobile industries alone require a large tonnage every year. Mill construction and method of manufacture have changed considerably since the early days of the industry. Efficiency in operation and a superior product has resulted from the more modern conditions surrounding the manufacture of steel sheets.

In ancient days the production of thin sheets of iron was accomplished by a very laborious process. Pieces of wrought iron were heated in blacksmith fires and hammered flat and as thin as possible on an anvil. Then several pieces were piled on top of each other, reheated to a red heat, and again hammered until the several layers had reached the required thickness. Naturally sheets of small dimensions only could be produced in this manner. Later the crocodile or helve hammer, driven by water power came to ease the hard manual labor of the smith.

The process of rolling sheets was invented in England in the eighteenth century. This was a marked step advance in that it not only produced sheets of more uniform thickness, more pliable and of larger dimensions, but also materially reduced the cost. In course of time many labor-saving devices in auxiliary machinery and for detail work were invented, but the fundamental principle in rolling has not been materially changed. American ingenuity, however, is still actively at work, and in the future highly improved rolling methods undoubtedly will be developed.

The invention of galvanizing, that is, the process of coating iron and steel with spelter, or zinc, for the protection of the material against corrosion, has broadened the field of usefulness of sheet iron and sheet steel enormously.

Previous to the last century, improvements in the methods of its manufacture progressed but slowly. Gradually, and from stage to stage, various modes came into use; principal of which were the Catalan forge, the blooming or knobbling fire, the blast furnace, and the puddling furnace. It has remained, however, for modern times to make marked advances in the iron industry, and in the production of steel, chiefly by the blast furnace and the Bessemer and Siemens-Martin, or open hearth process. The results have been immense tonnages and the development of a colossal industry.

In the United States the rolling of iron sheets was first started early in the nineteenth century, the first American sheet rolling mill being built in Pittsburgh in 1818, one hundred years ago. It appears that a plant was established by the Pittsburgh Steam & Engine Co. In that year, according to James Swank's book, "Iron in All Ages," the mill was established under the superintendence of Joshua Malen of Valley Forge, a well known figure at that time in the iron and steel industry. The mill had two steam engines each of 120 h.p. An idea of the wonderful development of the sheet iron business can be obtained when it is noted that less than 100 years ago a rolling mill with 240 h.p. was considered a large plant, while now the Vandergrift plant, which is only one of two large groups owned by the company, is equipped with over 12,500 h.p.

On account of the close connection between the steel sheet and galvanizing industries a brief history of the galvanizing process will be of interest. The process of coating iron with tin was invented about 400 years ago in Saxony. The process was kept a secret by the Saxons for nearly 100 years, but after diligent search English manufacturers about the end of the 17th century learned the secret. In England where some time after this discovery the process of rolling sheets was invented, the tin plate industry grew rapidly and for nearly 200 years England maintained the supremacy in this industry. In recent years, however, the United States has become a strong rival and is now the largest tin plate manufacturing country in the world.

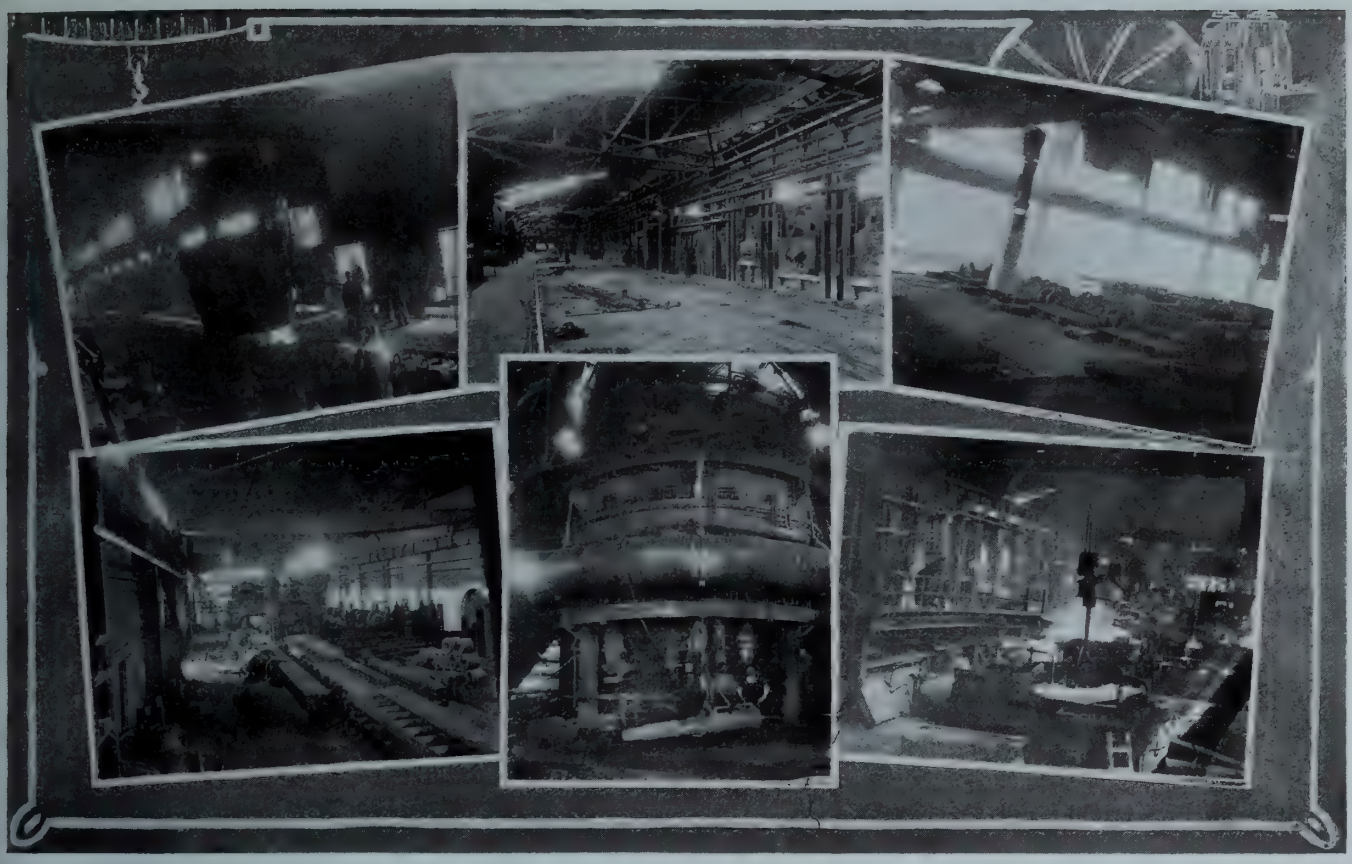
Tin plate was first made in the United States in 1872, but owing to the low duty on foreign tin plate, the manufacture of this material ceased in 1878. In 1890 the duty was increased by Congress and manufacturing was started again. Since that date the industry has developed in a remarkable degree in the United States. A few years ago a galvanizing plant was established in Hamilton by the Dominion Sheet Metal Co. and now the sheets are being rolled in Hamilton by the Steel Company of Canada, marking another stage in the industrial development of Canada. The next step will be the manufacture of tin plate and unless all indications prove erroneous, it will not be many years before tin plate is being made in this country.

Steel Company's Enterprise

The success which has attended the Steel Company's operations during the last three or four years has enabled the management to branch out into new fields of endeavor and continue the progressive policy which has always been associated with the concern's affairs. It will be understood that the financial outlay involved in the laying down of a sheet mill is considerable and can only be undertaken by a firm able to command the requisite capital. The Steel Company of Canada has during the past three or four years enjoyed a remarkable period of success and considerably augmented its financial resources. The large demand for its products during this period and business acumen of the management has placed the firm in an enviable position. It has also given the firm an opportunity to develop its business which will not only benefit the company but the country generally by reason of the large variety of home-made products available for other industries, keeping money in the country which otherwise would go abroad and also in the distribution of money in the form of wages. With the growing demand for



GENERAL VIEW OF MILL TRAIN AND COMBINATION SHEET AND PAIR FURNACES. THE COLD ROLLS ARE SHOWN IN FOREGROUND AND HOT ROLLS BEYOND.



TOP LEFT TO RIGHT: CASTING STEEL INGOTS. CHARGING FLOOR OPEN HEARTH FURNACES. REMOVING HOT INGOT FROM SOAKING PIT. BOTTOM LEFT TO RIGHT: INTERIOR VIEW OF BLOOMING MILL. BOTTOM OF BLAST FURNACE. CASTING PIT OPEN HEARTH FURNACE PLANT.

steel sheets in Canada the demand for the company's product will increase proportionately. An advantage which the Steel Company of Canada enjoys is that it makes the steel from which the sheets are rolled and can therefore produce steel of the correct analysis for the purpose for which it is required. The company is thus able to produce a high grade and even quality sheet with perfect assurance.

Other Plant Developments

In order to strengthen the company's position in regard to its supply of raw materials, a most important and necessary factor, the directors have acquired an interest in two valuable ore properties, one on the Mesaba Range and the other on the Gogebic Range. The proportion of the ore which the company is entitled to receive from these two properties will be sufficient to meet over half of its total ore requirements each year for a considerable number of years. The ore taken out each year is paid for on a royalty basis, so that beyond paying for its share of stripping and equipping the mines, no large expenditure of capital was necessary. During its season of 1918 the company will receive its quota of ore from the mine on the Gogebic Range and shipments from the Mesaba Range mine are expected to commence late in the season of 1918. Satisfactory arrangements have also been made recently for an ample supply of coal.

The company is constructing at Hamilton a large by-product coke oven plant which, it is expected, will be in operation by November. An ample supply of good quality coke will always be available for the blast furnaces, thus further relieving the company of anxiety in regard to supplies of raw materials. The by-products obtained from the ovens will make it a profitable undertaking.

Making Steel for Sheets

To impress upon the reader the advantages which the Steel Company of Canada possesses in manufacturing steel sheets, it will be in order to deal briefly with the manufacture of the steel from which the sheets are made. The company makes sheets straight from the pig iron to the finished product. It will thus be realized that the company was in a particularly favorable position to embark on the new enterprise. The plant is complete in every detail, and is generally conceded to be of most modern design and construction. A striking feature is the way in which "Safety First" mechanical appliances have been utilized to gain efficiency, save life and labor and keep down cost of production. Considering the size of the plant it is remarkable how few men are employed, although the pay roll of course is not by any means a small one. The physical condition of the plant is decidedly satisfactory and indicates the far-sighted policy of the management. Electric power is used wherever possible, a factor in the efficient operation of the plant.

Blast Furnace Plant

There are two blast furnaces, having a daily capacity of 400 and 300 tons respectively, one of these furnaces being devoted exclusively to the production of iron for the steel furnaces, while the other produces alternately malleable and foundry pig iron according to requirements of the market. The ore which comes in by boat is brown hematite, one of the richest forms, containing in some cases 68 per cent. of iron.

The blast furnace is charged at the top with ore, limestone and coke, which gradually descend and ultimately melt in the intense heat of about 3,000 degrees Fahr. The proportions of materials forming the charge are carefully regulated and vary according to the quality of steel required. The air for the blast is supplied at a pressure of from 15 to 30 lbs. per square inch, according to furnace conditions, the blowing engines being of the disconnected compound, long cross head, vertical type. The steam cylinders are 44 in. and 84 in. diameter by 60 in. stroke and are placed above the blowing cylinders.

Before entering the furnaces the air is heated to a temperature of from 900 to 1,250 degrees Fahr. by passing through the hot blast stoves. There are three stoves to each furnace, the stoves being 100 feet high by 20 feet in diameter, and heated by waste gases from the furnaces.

Refrigeration is used for drying the air blast before being heated in the

Cost, Then and Now

In Many Cases Material Has Increased in Price Over 175% — Taking Plumbing and Heating Installations When Completed the Increased Cost is Approximately 125%—No Immediate Reduction Should be Expected

SOME time ago a number of daily and weekly newspapers published a list of materials with cost of same which were necessary in the construction of a building or buildings before the war and now.

Strange to say not one item or mention was made regarding plumbing and heating goods. It would appear that our newspaper editors and writers do not think that such installations are to be reckoned with as necessary in the make-up of a building. As a matter of fact plumbing and heating is the most important of all details and very few persons could be found to disagree with this statement.

However, we simply mention that "no information was given regarding the cost of material and labor in connection with the plumbing and heating which do go to complete a building.

If, however, the opinion voiced in SANITARY ENGINEER when the war broke out had been taken note of and acted upon the housing problem throughout Canada would have been less acute. If banks and capitalists had been sane and gifted with a little more foresight we would have had thousands more buildings erected for 100 per cent. less money than these much-needed buildings will cost to-day. Just let us review the situation as it stood a week or two after war was declared by Germany on the whole world practically.

Thousands of buildings were under construction, involving millions upon millions of dollars. These partially erected buildings were left to deteriorate, hundreds of speculative builders, real estate men, and not a few workingmen lost their all as a direct result of the stand taken by every chartered bank and money man, all of whom lack a little common foresight and like a lot of frightened sheep turned tail and fled to cover, instead of standing at "attention" and viewing the situation in a stern, cool manner.

The following quotation from SANITARY ENGINEER, Sept. 1st, 1914, issue will make good reading at this time, and it may not be out of place to state that these very paragraphs appeared in almost every specialized trade paper published by us, the MacLean Publishing Co.

"In the unprecedent and critical situation that exists, it is of the greatest importance that every one should endeavor to act as if great events were not pending.

"Were confidence to be seriously disturbed, business would come practically to an end, and our ability to face the difficulties that may be in front of us would be seriously impaired.

"Therefore, it is of vital importance that as far as possible, the events that are now taking place should not interfere with the daily life and the daily work of the Nation. Orders should be given, factories should be run, everything should be so arranged as to maintain, as far as possible the income of the country.

"But for this to be accomplished the situation must be faced with courage and confidence on the part of everyone. Investors must continue to invest, bankers must continue to lend, the stock exchange must continue to deal, and everyone according to his or her ability must endeavor to work hard in order that individual incomes and investments shall not be jeopardized."

But what did happen and what has happened? Building operations ceased, etc., and as a result we are faced with the housing problem—a problem only one step behind in importance to the war and its complexities. Furthermore, the cost of material, because of that antiquated system of the law of supply and demand, has reached such a state which almost makes the cost of material and labor for use in building construction prohibitive. The increased cost can only be laid at the door of those pessimists who withdrew their money at a time when they should not have done so, and it is just those same people who should be made to bear the burden and the government should see to it.

The cost of plumbing and heating material and labor is shown by the accompanying tables both when the war broke out and now. These prices are wholesale prices paid and to pay by the trade when bought in quantities by sanitary and heating engineers.

We stated in a former paragraph that those money men whose fault it is that we have not several thousand more buildings than at present exist should bear a big portion of the burden, and we are pleased to note that the provincial government of Ontario has provided a fund of two millions of dollars to apply to a building scheme. This will mean that the wealthy will be taxed to a greater extent on the one hand and building speculation will be put upon a fairer and more equitable basis. One of the biggest curses of the housing problem in peace times is that of the "land grabber" and bulk building contractor. Neither of these help matters and if the government of the country can be prevailed upon to pay more attention to housing those who come to our shores in ships we will have better and more thrifty citizens. We will have cheaper buildings, though not necessarily lower prices in material and labor. The lower cost of buildings will be brought about by government regulation of land values, elimination of the speculative builder who, by the way, very seldom has much capital of his own to invest and if he has he very seldom is known to invest it. And last but not by any means least, standardization of fittings, fixtures and designs of buildings generally.

Uniform plumbing codes may be an important factor in bringing down cost of materials in some lines because of

Continued on page 30

DIFFERENCE BETWEEN 1914 AND 1918 PRICES

	1914	1918
1—5-foot White Enamel Tub	$15.70	$32.10
1 pair—Double Bath Cocks	2.40	4.10
1—Waste and Overflow	1.59	3.00
1 pair—N.P. Supply Pipes	1.60	2.85
1—18 x 21 White Enamel Lavatory, No. 197	5.35	8.75
1 pair—N.P. Index Cocks	1.50	3.00
1 pair—N.P. Supply Pipes	1.40	2.95
1—N.P. P Trap to Wall	1.65	3.50
1—18 x 30 Roll Rim Sink	8.30	16.80
1—1½" Centrifugal S Trap	.68	1.75
1 pair—N.P. Loose Flange Cocks	1.80	2.70
1—30-Gallon Standard Boiler	6.00	14.00
1—Stand	.35	.50
Boiler Couplings, pair	.17	.70
1—No. 20 Gas Heater (Ruud)	6.50	13.75
1—White Vitro Closet, complete	12.50	24.00 & 26.00
Soil Pipe, per foot, 4" medium	.21	.48
Soil Pipe, per foot, 4" extra heavy	.25	.60
4" Bend, X.H.	.39	.78
4" Bend, Med.	.30	.69
4 x 2 Ty X.H.	.72	1.44
4 x 2 Ty Med.	.63	1.26
½" Galv. Pipe, per foot	.04	.08
½" Galv. Elbows	.06½	.13
½" Galv. Tees	.06½	.15
Sheet Lead		

Summary of Approximate Increase

Enamelware	100%
Water and Pipe Fittings	100%
Brass Goods	80%
Boilers and Heaters	108%
Soil Pipe and Fittings	105%

ALL AROUND APPROXIMATE INCREASE IN FOUR YEARS 100%

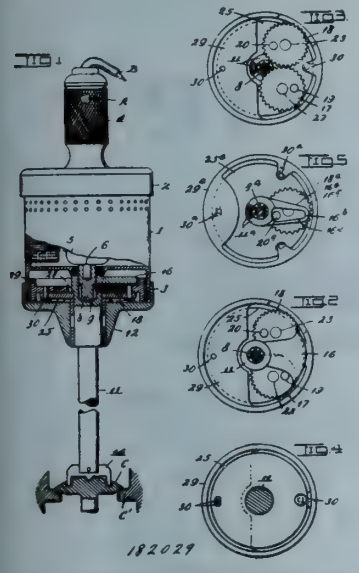
New Canadian Patents

No. 182,029.

Herbert Leggett, Kansas City, Missouri, U.S.A., 5th February, 1918; 6 years Filed 27th November, 1917. Receipt No. 288,096.

Claim.—1. In a valve grinding machine, a drive gear, a valve actuating shaft, a laterally extending lever fixed to said shaft, a support mounted for free oscillation about said shaft, and means carried by the support and driven by said gear to oscillate the lever and through reaction oscillate said support.

2. In a valve-grinding machine, a drive gear, a valve actuating shaft, a laterally extending lever fixed to said shaft, a support mounted for free oscillation about said shaft, means carried



No. 182,029. Valve Grinder.

by the support and driven by said gear to oscillate the lever and through reaction oscillate said support, and a weight member having play connection with said support.

3. In a valve-grinding machine, a tool actuating shaft, means for rotating continuously in one direction, a floating support forming a journal for said rotating means, and means acting through the rotation of said first-named means to oscillate the shaft and reacting to the resistance of the latter to oscillate the said floating support.

4. In a valve grinding machine, a tool actuating shaft, means for rotating continuously in one direction, a floating support fitting around said shaft and forming a journal for said rotating means acting through the rotation of said first-named means to oscillate the shaft and reacting under the resistance of the latter to oscillate the said floating support about said shaft.

5. In a valve grinding machine, a drive pinion, a tool actuating shaft, means driven continuously in one direction by said drive pinion, a floating support forming a journal for said driven means, and means acting through the rotation of said driven means to oscillate the shaft and reacting under resistance of the latter to oscillate the said floating support.

6. In a valve grinding machine, a tool actuating shaft, means for rotating continuously in one direction, a floating support forming a journal for said rotating means, means acting through the rotation of said first-named means to oscillate the shaft and reacting to the resistance of the latter to oscillate the said floating support, and a weight movable with said support and having a play connection therewith.

7. In a valve grinding machine, a gear pinion, a shaft, a lever projecting laterally from said shaft and provided with a cam slot, a wheel intergeared with said pinion, a pin projecting from said wheel into said cam slot, and a device forming a journal support for said wheel and mounted for oscillatory action to periodically shift the position of said wheel about the drive pinion without disengaging it from the latter.

8. In a valve grinding machine, a casing, a valve operating shaft journalled in and projecting from the casing, a drive shaft within the casing and aligned with the first-named shaft, a gear wheel driven continuously in one direction by said drive shaft, a lever projecting laterally from said valve operating shaft, a pin-and-slot connection between said gear wheel and lever whereby rotation of the former effects oscillation of the latter, and a support mounted to turn freely in both directions and forming a journal support for said gear wheel to shift the position of the latter without disengaging it from said drive shaft.

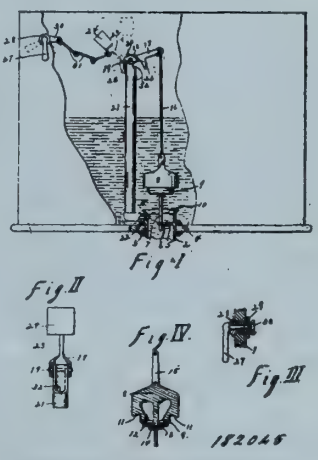
No. 182,045.

Bernard H. Mossinghoff, St. Louis, Missouri, U.S.A., 5th February, 1918; 6 years. Filed 21st November, 1917. Receipt No. 287,881.

Claim.—1. A valve seat, a bent lever, one arm of which is weighted and the other arm of which carries a non-floatable valve member adapted to rest on said valve seat, which bent lever is mounted and movable on its fulcrum in such a manner that the force pressing said valve member downward toward said valve seat, which is equivalent to the moment of the resultant of all of the gravity forces affecting said lever, gradually decreases with the gradual valve member raising movement of said lever, and means raising said valve member, the decrease in the buoyancy of said valve member, due to the decrease of its submergence at the recession of the water level, closing the valve.

2. A valve seat, a valve member, means pressing said valve member to said seat, means raising said valve member, and means gradually counteracting and reducing said pressure means when the valve member is thus being raised, the buoyancy of said valve member when submerged together with the counter acting means holding said valve member raised.

3. A valve seat, a valve member, a bent lever to one arm of which said valve member is connected and the other arm of which is weighted, which lever is mounted on its fulcrum in such a manner that said weighted arm approximately counterbalances the other arm with the connected valve member, when the valve member is in its raised position, which



182,045. Flush Valve.

counterbalances effect decreases with the closing motion of said valve member, and means actuating the valve.

4. A valve seat, a valve member, a fulcrumed bent lever to one arm of which said valve member is connected and the other arm of which is weighted to approximately counterbalance said valve member when the valve is open, the vertical line passing through the centre of gravity of which weighted arm gradually approaches the fulcrum point when said valve member is lowered to its seat, thus diminishing its resistance to the gravity of said valve member when the valve is closed.

5. A valve seat, a weighted valve member, pressure means opposing the gravity of said weighted valve member, which pressure is variable so that it gradually increases with the gradual opening of

Continued on page 30

Sanitary Engineers Should Advertise

Some Pointed Remarks Regarding the Way Some Sanitary and Heating Engineers Use Space in Their Local Newspapers—One Good Example Shown in Accompanying Article

WE must admit that sanitary and heating engineers all over the Dominion are using more "printer's ink" than ever before. Some prepare what would be termed fairly good copy, others anything but good, though once in a while a good advertisement does come to our notice.

For example, the accompanying advertisement which appeared in the Trenton *Courier*, Ontario, July 4th, shows in picture form what would have required an advertisement twice the size if more reading had been used instead of picture, would have taken longer to read, and would not have caught the attention of 9 out of 10 readers as did the one shown.

Mr. Fitzpatrick is to be highly complimented for having such a live and really interesting advertisement. The idea is novel and a good one. It tells a long story in few words and at once convinces the reader of a certain fact, that to ask a friend to ride in a 20-year-old automobile would be little short of an insult. Yet how much more insulting would it be to have to allow a guest to use an insanitary bathroom, and there are thousands of people to-day who have no bathroom accommodation at all in their homes, yet they own automobiles. It is, of course, more of a matter of education than anything else, and to educate the public, particularly those who reside in rural districts, is the work of every sanitary engineer.

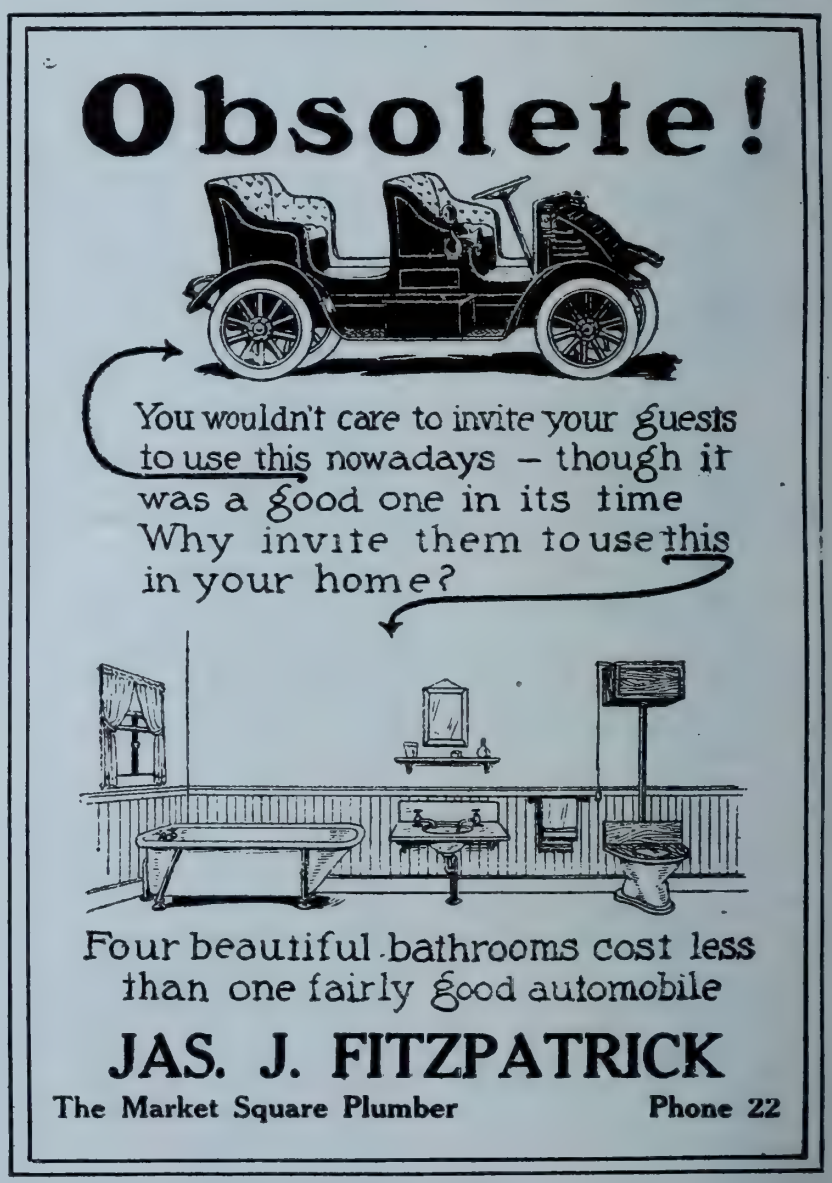
It would be a boon to every member of the trade if they would give more thought to the science of salesmanship, and show both by advertising and personal contact that a sanitary equipment in a home is far more essential to the average farmer than is an automobile. It is not the automobile itself that has made it so very popular with the farmer. It is salesmanship by personal contact, salesmanship by advertising. Look at the way an advertising campaign is carried on by the manufacturer of an automobile. Look how pictures are painted to the mind's eye, and then note the outside w. c., the cesspool, the filthy kitchen sink, which is left in the back ground.

The writer of this article knows of scores of farmers, who own fine autos, ride them into the city for pleasure, neglect their farms in many cases, who also own a fine house, in the rear of which is a filthy unsanitary convenience, and has often wondered whether those same farmers have been shown what the same amount expended on an auto would do if spent on a bathroom, a furnace, or a sewage disposal system.

It is up to the sanitary and heating engineer to advertise, not merely to say, "If you want a sanitary bathroom, hot and cold water at the sink, etc., call upon Jones & Co." That kind of advertising will never accomplish much. Can any of our readers imagine Ford saying, "If you want a car, call at our address and we will sell you one?" No, Ford did some advertising. He first of all, of course, got a car out at a price that could be paid by almost every working man. He paid $5.00 a day to every man, etc., but what did that $5.00 a day mean? It meant about $3.00 a day for labor and $2.00 a day for advertising. And, readers, Ford has got nothing on any member of the trade for success and real good serviceable goods. Ford hasn't got anything to sell and never will have that is half as essential to the country's welfare as has every sanitary and heating engineer. But they must advertise.

A few years ago the writer met a lady who had married a North-western farmer. The lady was the daughter of a one-time customer of the writer. She had been used to city conveniences, and when getting married, and going to live in the Northwest, she wrote a friendly letter to the writer regarding plumbing

(Continued on page 27.)



The above advertisement appeared same size in the Trenton Courier, it is more of a picture story told with few words, easily read and thoroughly understood at a glance.

SANITARY ENGINEER

PUBLISHED ON THE FIRST AND FIFTEENTH OF EACH MONTH.

THE MACLEAN PUBLISHING COMPANY, LIMITED
TORONTO, CANADA

JOHN BAYNE MACLEAN - - - - - - - President
H. T. HUNTER, - - - - - - - - - Vice-President
EDWIN NEWSOME - - - - - - - Editor

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GREAT BRITAIN—London, The MacLean Company of Great Britain, Limited, 88 Fleet Street, E.C., E. J. Dodd, Director. Telephone Central 12960. Cable Address: Atabek, London, England.

UNITED STATES—New York, R. B. Huestis, 111 Broadway, N.Y., Telephone Rector 8971; Boston, C. L. Morton, Room 733, Old South Building, Telephone Main 1204. A. H. Byrne, Room 900, Lytton Bldg., 14 E. Jackson Street, Chicago, telephone Harrison 1147.

VOL. XII. JULY 15, 1918 No. 14

THINGS HAVE CHANGED

WHEN an old gas bus of the vintage of 1907 or so wheezes by the chances are that you turn around and murmur "Ice." Or else you give some person a nudge and say "Some boat that."

Yet the old cars that ambled around in the days of 1903 had a place in the motor world that the super-six can't crowd into now. The gas wagon that came into existence when there were only two or three to a town was a centre of admiration. The man who owned it was a greater man than the chap after whose grandfather the main street was named, and almost on a par with the deacon who tapped the corner stone of the new church with a silver trowel.

Motor cars were first licensed in Ontario back in 1903. In that year the honor roll of horse scarers contained the names of 220 guilty parties. The horse in 1903 that didn't put its hind legs over the dash board in utter disgust at the approach of a car wasn't worth wasting the pasture on. The farmer cussed and cursed more than could be imagined at those "ding busted tin wagons."

But what a change has taken place since those days. We now find that as automobile owners, farmers head the list. In fact, one out of every three is owned by a farmer. Just think of it, out of a total of 78,861 car licenses issued in Ontario alone 23,409 were granted to farmers. These figures do not include motor trucks, of which there were 4,929.

Don't those figures suggest a change of heart on the part of the farmer? They certainly do. They also suggest that if farmers have money to buy autos they can well afford to have sanitary and heating equipment in their homes, and we find upon investigation that less than 5 per cent. of these car-owning farmers have bathrooms in their homes.

In Ontario alone we are told that upward of 150,000 farmers do not know the pleasures of a tepid bath every morning, in an up-to-date bathroom, and his women-folk don't know what pleasures there are in having hot and cold water on tap 24 hours a day.

There's profits for sanitary engineers as well as farmers, but both must get together. It's your move, Mr. Sanitary Engineer.

THE HOUSING PROBLEM

WITHOUT doubt, next to the war, the greatest problem confronting Canada as a nation is the housing problem. Almost every city in the Dominion finds a scarcity of dwellings, so much so that the Ontario Government are planning to loan or set aside $2,000,000 as a building fund, so as to assist to that extent in furnishing the needed capital to build houses. There are, however, a number of conditions to be adhered to. First, that the money will be loaned at not more than 5 per cent., that workmen's dwellings chiefly will require to be built and the cost of same must cost in the neighborhood of $2,500.

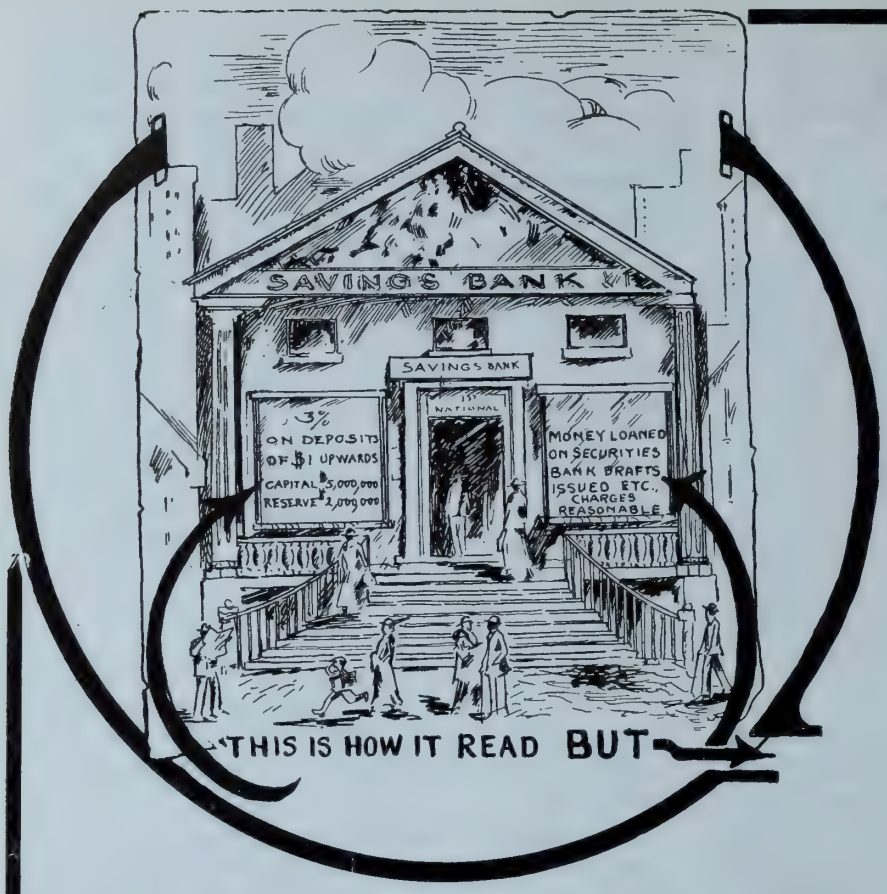
SANITARY ENGINEER has always taken more than an ordinary interest in the housing problem, and has several times taken the stand that the housing of Canadian citizens is a Federal problem, and as time goes on this opinion is becoming more widely spread.

If the Federal Government would set aside, say at least $50,000,000, for the purpose of erecting dwellings in either city, town or rural districts, and particularly for building farm homes, there would be no decrease in the population in our farming and rural communities. Not only so, but there would be a better class of men take up farming than is the case to-day.

Just imagine the way the Government acts now! A person applies for a homestead, he must do a certain amount of work on it, and live a certain period on it during a number of years, etc. But he gets tired, he has no home to live in, and never really settles down. He may fulfill all the necessary requirements and get his title, but what home comforts are there for him? None, and he finally drifts away back to an overcrowded town or city.

If, on the other hand, a scheme was in operation that would make it possible to build a comfortable home, with city conveniences, etc., and a certain amount of the crops were claimed each year in part payment for the house as well as the land, there would be thousands of men who would go back to the land. Thousands of our immigrants would never stop off at a city and not only so but a better class of men and women would come to our shores.

However in the meantime we are pleased to see that the Ontario Government has seen fit to assist in this most urgent problem.



HERE'S THE IDEA

EVERY sanitary and heating engineer should cultivate business with the farmer. He is going to have lots of money for many a long year, and he deserves it.

Every sanitary engineer should do his part in showing how much better a home is when it is equipped with a bathroom, hot and cold water at the sink, and every other convenience that is to be had in a city home.

There's more real happiness in a farmer's home where the wife is proud of her kitchen, her bathroom and her laundry, than there is in a city home, because the farmer has free fresh air, no noisy, dusty streets, fresh milk from the cows and eggs from the chicks all plus city conveniences.

Tell the farmer this story and see that his wife is one of the company when you tell it.

BE A BIGGER

HOW many farmers are there do
sand dollars in the bank, and
What would you say, Mr. San
there are in use 23,409 cars owned
issued by the Ontario Government t

Of course the farmers aren't sup
job to get a farmer to admit that he'
he's not writing good stuff all the time

Well now, working from the point
where the figures lead us. You'll hav
the hard luck story. Here they are:-

Farmers	
Skilled Trades	
Merchants, Manufacturers, etc.	
Physicians	
Other professions	

Now, we do not for one moment
In fact we believe they should. We
than most people and need the refre
farmer's wife, too, needs a change o
farmers were shown how much mo
system installed in their homes, than
a bank at 3 per cent., they would all

When a farmer invests his money
to borrow any from a bank he has t

When a farmer invests his money
where he lives at least half his life,
wife is proud of her home. His fami
3 per cent. on about a thousand dol
because of its increased value if he is



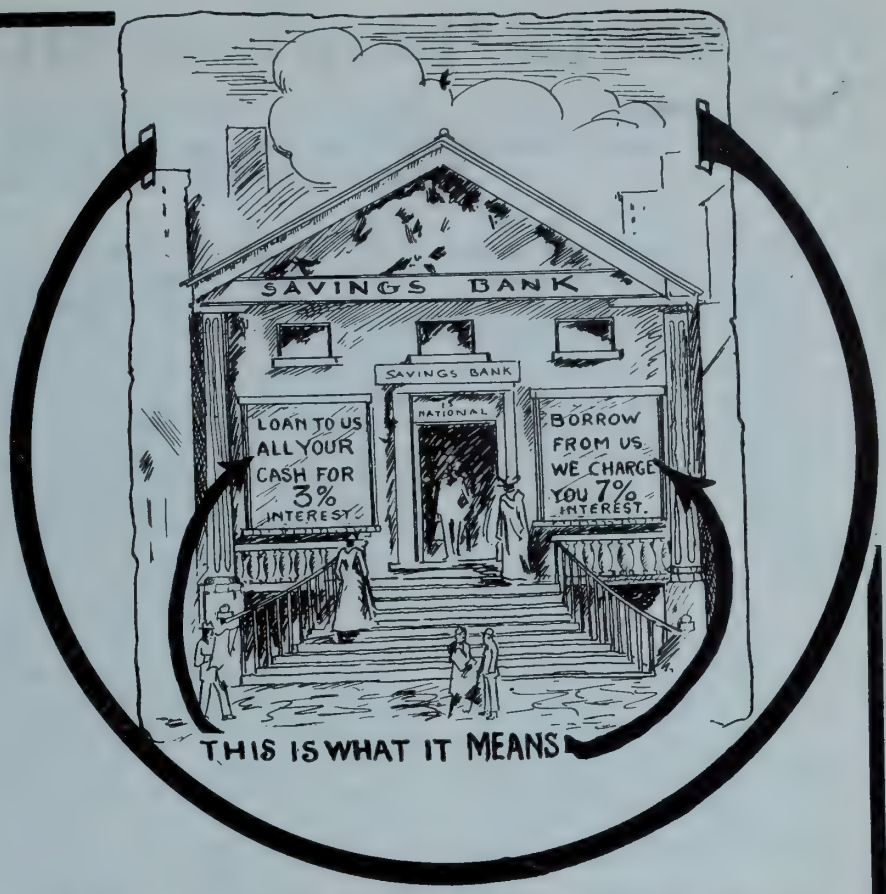
NESS BUILDER

ho own an auto, have a couple of thou-
bowl?
er, if you were told that in Ontario alone
Yet that is the number of auto licenses
ne in 1917.
making any money. It's just as hard a
ney as it is to get an editor to admit that

are not making any money, let's see
p of explaining to make them jibe with

mercial Travellers	1,079
abs	1,662
ellaneous	20,950
Total	78,861

that farmers should not buy autos.
are on their feet during a longer period
nd rest procurable by motoring. The
But we do think that if these same
it is to have a plumbing and heating
g a car or have their money invested in
om and furnace in preference.
he only gets 3 per cent., and if he wants
per cent.
ank, which is his house, his home, a place
rt on tap twenty-four hours a day. His
nt up to love their home all at a cost of
can borrow more money on his house
ash, thus making his house his banker.



JUST COMMON SENSE

THERE'S more efficiency in that household where every convenience is ready to hand than in the tin dish kitchen and the stove-heated house.

A farmer living in a fully equipped house will be healthier, wealthier and wiser. He will be able to do more work, be a clear thinker, and in general become a better citizen.

So it's up to you, Mr. Sanitary and Heating Engineer, to become a Bigger Business Builder by doing all in your power to fit up every farm and rural home with up-to-date plumbing and heating equipment. You will profit by so doing. You will profit your country by helping to make healthier homes and better and happier farmers.

After all, the prosperity of the farmer is the true success upon which nations are built.



Necessity for a Federal Health Dept.

Further Striking Proof at Kingston of This Urgent Need — Water so Polluted by Sewage That it is Unfit for Bathing, but is Good Enough to Drink— Impotence of Provincial Authorities

SCARCELY a week passes that does not bring to light fresh evidence of the urgent necessity for the institution at Ottawa of a Federal Health Department. The following item, which we take from the Kingston "Standard," provides striking proof that the provincial authorities are either asleep or are powerless to deal with a matter of such vital import to the health of our fellow-citizens:

"The letter of City Engineer McClelland on the bathing house question, which the "Standard" published on Saturday, must have been a shocking revelation to the people of the city—not, however, for what it said in respect to the bathing house question but for the disclosures made in respect of the amount of sewage that drains into the harbor, between the Grove Inn dock and O'Kill street, at the edge of Macdonald Park. According to the Engineer—and we quote his exact words:

"'**Nearly all the sewage from the western portion of the city west of Barrie street and south of Princess street, empties into the harbor between O'Kill street and the Grove Inn dock, and the water front between these two points is unfit for bathing purposes.**'

"That is to say, practically from the Penitentiary down to Macdonald Park the water is so polluted that it is unfit even for bathing.

"And yet, a few hundred yards lower down is our city water works and a relatively few hundred yards out is the mouth of the intake pipe through which is pumped all the water we are to-day using—**and drinking**—in the city. When one considers the sweep of the currents in the harbor and the curve of the point at the western end of Macdonald Park, the significance of this statement becomes more apparent; for the intake pipe would seem to be almost in a direct line of these currents.

"Unfit for bathing! And yet we drink it, with some chlorine to boot!

"Is it not time the city wakened up to the seriousness of this situation and decided to take steps to get rid of this disease-impregnated water by building a huge intercepting sewer or by getting our water supply either away up near Lemoine's Point or from one of the back lakes? As it is now, we are deliberately courting disaster —and Death!"

We do not pretend to say who is to blame for such a state of affairs, but we do know that it would be impossible for such conditions to exist if we had a Federal Department of Health such as we have long advocated.

The trouble with leaving such matters as these to be dealt with by local authorities is that no sooner does some clear-headed man of high purpose and integrity propose a remedy than it is for some inadequate reason, either political or financial, opposed by those who have an axe of some kind or other to grind on the local political millstone. The ensuring of a few votes by a false reputation for economy in use of the public money is more to many local politicians than a feeling of having done their best on behalf of their fellow-citizens. There are times when the opposition to the expenditure of money for a purpose of vital necessity falls little short of a crime.

Toronto has a medical health officer second to none on this continent, yet he is continually bickered at and hampered in his work by puny-minded men, whose outlook as far as the public welfare is concerned is obscured by the ever-present necessity of doing something to secure votes in order that they may continue in office, and a cheap way of obtaining notoriety is by endeavoring to cut down the estimates of the medical health officer.

Instead of endeavoring to limit the activities of such a man as the present holder of this position the citizens of any such city should take a pride in making whatever outlay he may deem necessary. They may rest assured that no expenditure would be advocated unless it were of prime necessity, and that any endeavor to economize will cost them far more in the long run than the original estimate.

Dr. Michael Steele, M.P. for South Perth, recently gave some interesting figures in support of his contention as to the desirability of establishing a Federal Health Department. He said:

"One of the many subjects brought to the front by the war is that of the health of the people. The army takes only fit men. The fit man has, therefore, not only to fight for himself and his interests, but to fight for the unfit man and his interests—an unequal sharing of the war burden. With nearly 50 per cent. of the men of military age physically unfit we see what a national loss in war time is the absence of perfect health.

"The war, too, has demonstrated how effectively the state can care for its people. By attention to preventive measures the death rate in the British army from sickness has been less than that among men of military age at home.

"The army compulsorily teaches a man how to live in order that his health may be of the best. Those entrusted with the administration of affairs in civil life, whether national, provincial, or municipal, should learn a lesson from this.

Says 15,000 Children Could be Saved Yearly

"When we know that in Canada there occur every year 30,000 deaths of children under one year of age, and that 15,000 of these little lives could be saved, we must appreciate the need for action.

"When we further realize that 50,000 deaths occur in each year in this country that could be avoided, we must feel astounded at our indifference. Canada loses each year a number equal to one-tenth of the population of Toronto, whose lives are being sacrificed by the neglect of those entrusted with authority. These lives can be saved by the application of existing and known methods of life saving, applied by those in charge of our health departments.

"The best method of increasing our population is to save the lives of those already in the country—Canadian-born citizens.

"The deaths, however, are not the only loss suffered by the nation. Five hundred thousand people each year in this country suffer from illness which can be prevented, and this entails a national loss of $100,000,000 annually. The larger portion of this falls upon the laboring classes, who can least afford it. To sickness is due a great part of the calls upon our charitable societies. Sickness causes seven times as much destitution as accidents and fifteen times as much as unemployment, yet we legislate liberally to prevent the latter two conditions, while we largely ignore the former.

Economic Loss Through Sickness Vast

"The economic loss due to sickness is appalling, and this phase of the question will ultimately be chiefly instrumental in teaching our Canadian people to give proper attention to the physical welfare of our population. Loss of life and health causes a serious reduction in the productive efficiency of our nation.

"After the war the highest efficiency will be demanded of the nations that are to survive in the industrial struggle which will undoubtedly ensue. Canada must be one of these nations, and the health of her people must be cared for by her legislators if she is to attain that position in the industrial world which her natural resources and the vigor and intelligence and skill of her people fit her to attain.

"The desire for a Federal department of health is growing. Many public bodies are taking it up. Employers of labor are beginning to recognize the advantages and the laboring man is realizing that the nation owes him a healthful environment if he is to give to the nation his best service.

"Such conditions can best be brought about by a department of health established under Federal control.

"There are thousands of practical men all over this continent who if permitted to work for the country's good in medical or mechanical positions under the jurisdiction of a Federal Health Department would stamp out every preventable disease known to man, as well as assist materially in building up a fine robust race of Canadians at a far less monetary cost than is the case to-day. Just imagine 50,000 souls passing to the Great Beyond every year because of downright carelessness on the one hand, and because we have men who look upon a dollar bill as if it were the size of a 6 by 9-foot poster."

Building Operations Ahead of Last Year

Total Value of Building Permits Issued for the Six Months Amount to Over Sixteen Million Dollars—Most of This Sum is for Small Buildings, Such as Dwellings —In Point of Numbers Thirty-Six Cities Show Gains

BUILDING conditions in Canada as reflected by the record of permits issued in the larger centres of population during the month of June show very slight improvement over a year ago and, in fact, if the higher cost of labor and materials is taken into account, it would appear as if there were no improvement at all. The total value of permits reported to SANITARY ENGINEER by twenty-five eastern and eleven western cities is $3,602,940, an increase of just $8,880 over June, 1917, for the same cities.

Contrary to the experience in May it is the eastern cities which record the gain, while western cities have fallen back by nearly an equivalent amount. Whereas the former enjoyed an increase of $256,173, the latter dropped back by $247,293. This was due very largely to the improvement shown by Toronto in the east and the decline experienced by Winnipeg in the west.

Six Months' Record

The showing for the half-year is fairly encouraging. The thirty-six cities are ahead of 1917 by $738,432, or close to three-quarters of a million dollars. This gain is due entirely to the increased building activity in the West, particularly in Calgary, Regina and Vancouver. The eleven western cities combined show a total for the six months of $4,344,954, an advance of $1,275,537 over 1917. On the other hand, eastern cities are behind by over half a million dollars, large declines being shown by Montreal, Quebec, Hamilton and Windsor.

Toronto takes the lead in June both in the value of permits issued and in the gain over June, 1917. It reports a total of $1,006,014, as against $692,794 last year. Winnipeg, which stands second, had a total of $432,400, but its record falls short of 1917 by $322,800. Montreal was down to $297,560, a drop of $60,185 from last year.

The activity in Halifax incident to rebuilding operations is evidenced by a rise in its permits to $200,086, a gain of nearly $100,000. All the Quebec cities are behind last year. In Ontario, next to Toronto, the best performance was by Fort William, where permits for $158,500 were issued, an increase of $133,400. Brantford Galt, Kingston, Peterboro, St. Catharines and Welland all enjoyed small gains. Chatham led in the declines with a decrease of $122,950, with Windsor and London second and third, the former being down by $94,855 and the latter by $92,030.

In Western Cities

Winnipeg's decline from $755,200 to $432,400 was the dominating feature in the West. The only other cities with permits exceeding $100,000 were Saskatoon, where the issue reached $176,510 and Calgary with $133,600. The former showed a decline of $73,280, while the latter was ahead by $32,300 as compared with 1917. In all the other cities the amounts involved were small.

HALIFAX BUILDING IS ON THE BOOM

HALIFAX.—The work of reconstruction goes on rapidly, and the value of the building permits for the month of June, chiefly on this account, was $200,000, as compared with $102,750 for the month of June last year. The total for the year to date is $975,192. The total for the month of May was slightly higher than in June, namely, $298,940. These totals do not include the work that is being carried on by the Dominion Government or the military authorities.

The Relief Commission will start work soon on the construction of forty houses of concrete in the devastated area, and in addition some wooden houses in Dartmouth. Preliminary work for the temporary building and train shed at the south end terminals is going ahead. Work on several hospitals will soon be completed, including an addition to the children's hospital.

The city itself is adopting the percentage basis in securing tenders for repairs to seven buildings that were damaged by the explosion. These include the City Hall, the prison, market, incinerator, public gardens workshops. These are to be in by July 15.

BUILDING PERMITS FOR THE MONTH OF JUNE

	June, 1918	June, 1917	Change	6 mos., 1918	6 mos., 1917	Change
Eastern Cities						
MARITIMES—						
Halifax	$ 200,086	$ 102,750 +	$ 97,336	$ 975,192	$ 465,061 +	$510,131
St. John	2,250	62,750 —	60,500	224,725	467,150 —	242,425
Sydney	59,393	38,863 +	20,530	194,290	134,631 +	59,659
QUEBEC—						
Montreal	$ 297,560	$ 357,745 —	$ 60,185	$2,039,565	$2,466,659 —	$427,094
Quebec	48,300	86,179 —	37,879	487,954	822,636 —	334,682
Westmount	10,366	45,045 —	34,679	85,366	79,391 +	5,975
Lachine	2,675	13,725 —	11,050	173,465	217,508 —	39,043
ONTARIO—						
Brantford	$ 55,235	$ 21,495 +	$ 33,740	$ 287,060	$ 65,795 +	$221,265
Galt	9,000	1,760 +	7,240	80,535	58,890 +	21,645
Hamilton	273,653	288,020 —	14,367	866,653	1,388,740 —	522,087
Kingston	32,230	10,192 +	22,038	134,704	76,279 +	58,425
Kitchener	5,040	14,450 —	9,410	66,315	126,732 —	60,417
London	58,200	150,230 —	92,030	289,875	409,150 —	119,275
Peterborough	100,040	38,165 +	61,875	174,835	108,088 +	66,747
Port Arthur	6,358	13,268 —	6,910	557,031	384,784 +	172,247
Stratford	9,760	19,396 —	9,636	47,285	110,654 —	63,369
St. Catharines	62,975	22,300 +	40,675	270,782	233,075 +	37,707
Toronto	1,006,014	692,794 +	313,220	3,741,015	3,323,778 +	417,237
Woodstock	9,230	2,435 +	6,795	53,867	58,342 —	4,475
Welland	96,715	22,530 +	74,185	273,439	155,725 +	117,714
Windsor	41,180	136,035 —	94,855	322,590	610,695 —	288,105
Chatham	27,400	150,350 —	122,950	86,110	186,445 —	100,335
Fort William	158,500	25,100 +	133,400	346,820	359,815 —	12,995
St. Thomas	6,320	5,055 +	1,265	21,915	34,880 —	12,965
North Bay	300	1,975 —	1,675	7,655	5,745 +	1,910
Total 25 E. Cities	$2,578,780	$2,322,607 +	$ 256,173	$11,814,043	$12,350,648 —	$536,605
Western Cities						
MANITOBA—						
Brandon	$ 8,360	$ 7,500 +	$ 860	$ 24,291	$ 74,330 —	$ 50,039
Winnipeg	432,400	755,200 —	322,800	1,138,400	1,602,850 —	464,450
ALBERTA—						
Calgary	$ 133,600	$ 101,300 +	$ 32,300	$ 813,800	$ 210,600 +	$603,200
Edmonton	57,175	37,500 +	19,675	140,230	125,700 +	14,530
Lethbridge	5,720	7,318 —	1,598	85,068	41,688 +	43,380
SASKATCHEWAN—						
Moose Jaw	$ 68,675	$ 14,400 +	$ 54,275	$ 336,530	$ 154,935 +	$181,595
Regina	72,280	44,525 +	27,755	601,290	148,640 +	452,650
Saskatoon	176,510	249,790 —	73,280	342,610	309,915 +	32,695
BRITISH COLUMBIA—						
Victoria	$ 6,390	$ 5,485 +	$ 905	$ 164,580	$ 36,365 +	$128,215
Vancouver	59,300	42,555 +	16,745	665,855	323,894 +	341,961
N. Westminster	3,750	5,880 —	2,130	32,300	41,000 —	8,700
Total 11 W. Cities	$1,024,160	$1,271,453 —	$ 247,293	$4,344,954	$3,069,917 +	$1,275,037
Gr. tot. 36 Cities	$3,602,940	$3,594,060 +	$ 8,880	$16,158,997	$15,420,565 +	$738,432

Market Conditions and Tendencies

Statements Regarding the Prices and Trend of Supplies.

THE MARKETS AT A GLANCE

MANUFACTURERS who work with iron and steel are finding it increasingly difficult to maintain operations on a satisfactory basis. One manufacturer's request for material has been flatly refused, and others are meeting with similar turndowns. Only those on the preferred list, chiefly those operating on Government contracts of some nature, are securing supplies in sufficient volume to keep up plant production.

Figures given out as to the United States Government's requirements (20,000,000 tons) of steel for the last half of 1918 are in themselves sufficient to throw a damper on the hopes of those who had hoped production might have so far exceeded Government needs by this time that commercial demands might have secured a fair allotment of the surplus. Indications point to capacity production, or nearly so, and complete absorption for war needs.

This will affect manufacturers of soil pipe and fittings, range boilers, wrought iron pipe, etc., and the future looks like a period of dwindling stocks, with little opportunity for replacement. Stocks of sheets are becoming depleted, and whereas some shipments are coming through, they are insufficient to keep stocks intact as to sizes and gauges.

Tin shows strength in the ingot metal market, stocks being pretty well absorbed and the future as regards supplies doubtful. Lead is also in a strong position, besides being reported scarce. Copper is steady, but none available except for Government work; this metal is also reported in light supply.

TORONTO, July 29.—After a period of many price revisions towards the beginning of the month, a steadier tone is now evident and practically all lines are unchanged from revisions noted in the last issue. Manufacturing conditions become increasingly difficult and in some lines into which iron and steel enter the outlook for a continuation of operations is becoming dark. Tin shows additional strength and lead is also held very firmly. Business continues very fair.

Very Firm Undertone to Range Boilers

RANGE BOILERS.—Greater difficulty in securing sheets is being experienced and this is having a bearing on the production of range boilers with the outlook for the future decidedly uncertain. As noted for some time past, some sizes are unobtainable and that other sizes will be added to the list seems more than probable. Sales are being made at the following figures:

	Standard	Extra Heavy
30-gallon range boilers	$14.00	$17.00
35-gallon	17.00	20.50
40-gallon	20.50	24.00
52-gallon	28.00	32.00
66-gallon	37.00	42.00
82-gallon	45.00	50.00
100-gallon	62.00	70.00

Enamelware Holds In Unchanged Position

ENAMELWARE.—As outlined in last issue prices compared with those ruling in the United States are low and as long as possible the present basis of quotations will be maintained locally. Building operations as far as the enamelware is concerned could be encouraged with profit to both the sanitary engineer and the builder. The opinion rules that prices will be higher before any decline can be looked for.

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Sinks, roll rim, 18 x 30 in., staple	16 80
Closets, oak tank and seat	24 00
Do., enamel iron or white vitro tank	26 00

Little Encouragement To Soil Pipe Manufacturers

SOIL PIPE, FITTINGS.—Little encouragement is being given manufacturers of soil pipe in the matter of obtaining supplies to "carry on." One manufacturer stated that they had received a flat refusal to their request for material which means that unless they secure some modification of this ruling, operations will cease at an early date. This provides a firm undertone to the market but as practically all the output that can be manufactured is sold, no immediate advance in price is contemplated.

SOIL PIPE FITTINGS.

Medium and extra heavy soil pipe, 6-inch and under	30%
8-inch soil pipe	25%
Medium and extra heavy fittings, and under	40-40 & 2½%

C. I. PIPE FITTINGS.

Cast iron fittings	Net List
Plugs	15%
Bushings	18%
Flange unions, standard	Net List
Dart unions, ¼-inch to 2-inch	15%
Do., 2½ in. and larger	6½%
Nipples, up to 4-inch	45%
Do., 4½-inch and larger	40%
Do., running thread 4-in. and under	25%
Couplings, 4-in. and under	35%
Do., 4½ in. and larger	15%

MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittgs., Class A, lb.	.60	.75
Do., Class B., lb. net	.27	.37
Do., Class C., lb. net	.19	.27

No Change in Waste; Oakum Remains Firm

WASTE, OAKUM.—There has been no great change in prices on waste since last issue. A higher tendency on wool waste with wipers showing an upward trend is noted. The demand continues satisfactory. No developments of particular interest are provided for in oakum situation. Prices hold firm and unchanged with sales considered good.

	Per 100 lbs.
Best American	$21 50
Clipper, spun	21 00
Do., unspun	19 50
Plumbers', spun	11 00

Valves Hold At Recent Advances

VALVES.—The recent advances made in valves, stop and waste cocks, compression bibbs, etc., have been firmly main-

tained. No further change is anticipated for some little time though the scarcity of material, proposed advanced freight rates and continued advance in the cost of labor do not tend towards a recession from present values. Discounts are as follows:

	Discount off list
Ground work	42
Compression work, standard	47
High grade	41
Cushion work	40
Fuller work, standard	45
High grade	38
Basin cocks, No. 0 standard	40
Nos. 1 and 2	40
Bath cocks	50
Flatway stop and waste cock, standard	50
High grade	47
Roundway stop and waste cocks, standard	50
High grade	47
Brass steam cocks, standard add 10%.	
Globe, angle and check valves, standard.	Net
Do., removable seat	Add 5%
Radiator valves, standard	10
Do., removable seat	Net List
Patent quick opening valves	30
Basin Cocks—	
No. 0 and 1, Fuller pattern	45
Globe, angle and check valves, standard, medium pressure	20
Radiator valves, standard med. pressure.	30
Radiator valves, removable seat, medium pressure	25

Wrought Iron Pipe Firm and Unchanged

WROUGHT IRON PIPE.—Developments are of an uninteresting nature as regards wrought iron pipe. Manufacturers are finding it increasingly difficult to maintain production and with the larger sizes particularly is this noticeable. Prices are unchanged at advances noted in last issue and shown in panel herewith:

NEW SCHEDULE OF PRICES ON WROUGHT IRON PIPE

Price List No. 36 (July 5, 1918)

	Black Per 100 feet	Galvanized Per 100 feet
Standard Buttweld		
⅛ in.	$ 6 00	$ 8 00
¼ in.	5 22	7 35
⅜ in.	5 22	7 35
½ in.	6 63	8 20
¾ in.	8 40	10 52
1 in.	12 41	15 56
1¼ in.	16 79	21 05
1½ in.	20 08	25 16
2 in.	27 01	33 86
2½ in.	43 29	54 11
3 in.	56 61	70 76
3½ in.	71 76	88 78
4 in.	85 02	105 19
Standard Lapweld		
2 in.	29 97	36 45
2½ in.	45 05	55 28
3 in.	58 91	72 29
3½ in.	73 60	91 54
4 in.	87 20	108 45
4½ in.	99 06	123 82
5 in.	115 40	144 30
6 in.	149 80	187 20
7 in.	195 20	243 95
8 L in.	205 00	256 25
8 in.	236 20	295 20
9 in.	282 90	353 25
10 L in.	262 40	328 00
10 in.	337 80	422 30

Terms 2% 30 days, approved credit. Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

No Redeeming Feature In Tube Outlook

BOILER TUBES.—No redeeming feature in the outlook on boiler tubes is visible. Supplies are very scarce and very few shipments getting through. The situation remains serious.

Toronto—	Per 100 feet Cold drawn	Lapweld
1 inch	$36 00	$ ....
1¼ inch	40 00	....
1½ inch	43 00	36 00
1¾ inch	43 00	36 00
2 inch	50 00	36 00
2¼ inch	53 00	38 50
2½ inch	55 00	42 00
3 inch	64 00	50 00
3¼ inch	....	58 00
3½ inch	77 00	60 00
4 inch	90 00	75 00

Sheet Stocks Dwindling; Prices Hold Firmly

SHEETS, PLATES.—Dealers face a situation where stocks are gradually dwindling with little opportunity for replacement. Manufacturers are absorbing fairly large quantities of jobbers' stocks and the outlook is no brighter than it has been for some time past. There are a few shipments of galvanized coming through but these are not sufficient to maintain stocks at normal levels. Quotations given herewith are unchanged, though very firm:

BLACK SHEETS—	Per 100 lbs.		
10 gauge	$....	$10 00	$12 00
12 gauge	....	10 10	10 00
14 gauge	7 45	7 90	8 40
16 gauge	7 50	8 00	8 50
18-20 gauge	7 80	7 55	8 05
22-24 gauge	7 85	7 60	8 10
26 gauge	7 90	7 65	8 15
28 gauge	8 00	7 75	8 25
3-16,inch plate	....	10 10	10 25
¼-inch boiler plate	....	....	10 00
GALVANIZED SHEETS—			
10¾ oz.		$9 50	$9 75
U.S. 28		9 20	9 45
U.S. 26		8 90	9 15
22 and 24		8 75	9 00
18 and 20		8 60	8 85
16		8 45	8 70
14		8 35	8 60

Very Firm Tone in Lead Products, Solder

LEAD AND ZINC PRODUCTS.—A very steady situation is noticeable in manufactured lead products though it must be said the strength of the lead market is showing in a firm undertone to the manufactured article. Solder holds at unchanged figures though the position of tin grows stronger and with lead also firm, the tendency in solder is not hard to determine. Quotations are given herewith:

Lead pipe, lb.	$0 15	$....
Lead waste pipe, lb.	0 16	....
Lead traps and bends	Net list.	
Lead wool, lb.	0 15½	0 16
Lead sheets, 3 to 3½ lbs. sq. ft., lb.		0 13¼
Lead sheets, 4 to 8 lbs., sq. ft.	0 12½	0 13
Cut sheets, ¾c lb. extra, and cut sheets to size, 1c. lb. extra.		
Solder, guaranteed, lb.	....	0 60
Solder, strictly, lb.	0 55½	0 68½
Solder, commercial, lb.	0 51	0 52
Solder, wiping, lb.	....	0 55
Solder, wire, lb.	0 70	0 80
Zinc sheets	....	0 26

Little to Note in Old Material Situation

OLD MATERIALS.—The scrap metal trade is not brisk. Buyers are anxious to get material to sell quickly, but that is the kind where there is the greatest shortage. Heavy melting steel and good machinery scrap are much desired just now. At U.S. points the shortage is quite marked, and firms are willing to bring the stuff a considerable distance, paying the excess freight charges in order to secure the metal. Other lines are inactive and uninteresting.

Tea lead	$0 05¼	$....
Heavy lead pipe	0 07½	0 07¾
Yellow brass	0 12	0 13
Red brass	....	0 21
Light brass	....	0 09½
Heavy zinc	0 05½	0 06
Heavy copper	0 21½	0 22
Stove plate, per ton	17 00	18 00
Old cast iron, per ton	25 00	26 00

Tin Shows Strength; Lead Holding Firm

INGOT METALS.—Increased strength is noticeable in respect to tin and higher prices have been named in some quarters. Supplies are scarce and continue hard to get. Lead is very strong with supplies light. Spelter is a little easier. Other metals remain unchanged.

COPPER.—Supplies are none too heavy and already there is a movement on foot to have prices raised again in August when time expires for present scale. In this way it is felt production might be speeded up. Supplies locally are light and prices unchanged at 30-32c per pound.

TIN.—Advances have been made in some quarters, widening the range of quotations which now runs from $1.15 to $1.50 per pound. Supplies are light and shipments hard to get. Advances have been made on the London market.

SPELTER.—A somewhat easier tendency is to be noted and quotations do not exceed 10½c per pound. Supplies are ample for all requirements, it is intimated.

LEAD.—This market is very strong and working under influence of light supplies. Quotations have remained unchanged at 10½c to 11½c per pound. Commercial demands generally are being met.

ALUMINUM.—Nominally quotations remain around 50c per pound with Government demands absorbing very largely available supplies.

ANTIMONY.—The market has held firm and a little wider range is noticeable at 18c to 21c per pound. A fair movement is reported.

PIG IRON.—Reports from the United States intimate that Government needs continue to absorb practically all the output of the mills, and similar conditions may be said to prevail here. Commercially, pig iron is almost unprocurable.

UP to the present, the fire loss of the Dominion of Canada is 25 per cent. greater than for the corresponding period of last year. If this rate of destruction continues, the loss will exceed thirty-two million dollars in 1918, and, together with expenditures upon insurance and fire protection, will constitute a burden of over $65,000,000. This means about $10 out of the pocket of every man, woman and child in Canada, or almost $40 for the average family.



JOINED MILITARY STAFF

It is doubtful if there is one trade that has been called upon to furnish as high a percentage as has the plumbing, heating and ventilating trade. When the war broke out there were several thousands of men out of employment, and all were fit and strong. Manufacturers, too, of plumbers' supplies let a lot of men out, and recently there has been quite a heavy call on the various plants. Frank E. Newlands, for nearly eight years with the Anthes Foundry, Ltd., is one of the latest to join up. He is with the military staff at Niagara at present.

RETURNED TO THE FRONT

Those members of the trade in the West will be interested to learn that Geo. W. Endress, of Moncrieff and Endress, Winnipeg, representatives of the Wallaceburg Brass Mfrs., Wallaceburg, Ont., has returned to the trenches. He went overseas about two years ago, was wounded in action and invalided home for a while.

FIFTH ANNUAL MEETING OF THE SANITARY INSPECTORS' ASSOCIATION

The fifth annual business meeting of the Sanitary Inspectors' Association of Western Canada was held in the council chamber, Winnipeg, July 19th, when a representative gathering from the Prairie Provinces was on hand.

Among the visitors was T. Murray, of Toronto, consulting engineer to the government of Saskatchewan. The delegates from the West were A. M. S. Allan and J. A. Symons, of Regina; the president in the chair was W. T. Thornby, deputy chief of the city health department.

Before proceeding with the business of the meeting, Mr. Murray was invited to address the gathering, and spoke of the importance of the work of sanitary inspectors, pointing out the great improvement in community life that had followed the appointment of such officers. He presented features of the work and pointed out the duties of inspectors, giving some good advice, particularly warning all against being arbitrary in their attitude toward the citizen.

In a discussion looking to the naming of permanent headquarters, there was some difference of opinion, and it was decided to leave the question open, Winnipeg being continued as headquarters for the present. The election of officers resulted as follows:

President, A. Riby, dairy inspector, Winnipeg; vice-presidents, Western Ontario, W. E. Stanley, of Fort William; Manitoba, D. Little, health inspector, Winnipeg; Saskatchewan, H. D. Mathias, of Regina; Alberta, J. J. Dun, of Calgary; British Columbia, F. S. De Gray, of Victoria.

Executive committee: W. E. Thornby, immediate past president; Jas. Arkle, health inspector, Assiniboia; Dr. Bowman, Assiniboia; Alex. Aitken, health inspector, Winnipeg; Alex. Barclay, inspector, Winnipeg.

Secretary-treasurer: Alex. Officer, tenement inspector, Winnipeg.

Auditors: W. F. D. Ward and J. M. Hardy, Winnipeg.

Votes of thanks were passed to the officers of last year, to Mayor Davidson and Council for use of the Chamber and to the press.

NEW HEATING PLANT

Permission has been granted to Sir John Eaton by the City Architect for the installation of a brick and concrete central heating plant with underground tunnel at 301 Spadina road at a cost of $35,000. Permission was also granted for the addition of another story to the service wing of his residence at "Ardwold" at a cost of $5,000.

PUTTING WAR CRIPPLE BACK ON THE PAYROLL

Fifty Maimed Soldiers Will Demonstrate Vocational Training at The Canadian National

Much has been heard regarding the plans of the Dominion Government to help war cripples to secure remunerative employment in spite of even the most serious wounds or other injuries. But, though Canada is conceded to be far in advance of all other Allied countries in the work of reinstating her maimed heroes, comparatively few people have seen actual evidence of the miracles being wrought for the men by specialized vocational training and physical reconstruction. This will be remedied at the Canadian National Exhibition where at least fifty men who have been restored to full usefulness will demonstrate how the soldier beneficiaries of the Government's rehabilitation programme have been made economically self-supporting. Included will be a number of blind men, who have been re-educated and are back on the civic payroll. The men will demonstrate at least 15 industrial processes, including typesetting, oxy-acetylene welding, jewelry manufacture, lens grinding, assaying, etc.

WINDSOR GARBAGE INCINERATOR

The reconstruction and enlargement of the garbage incinerator at Windsor, Ont., is now completed. The plant is of similar design to those installed at Kitchener, Ont., and Transcona, Man., although some new features have been added which improve the efficiency and reduce the cost of operation still further.

In each cell there are 35 square feet of grate bar area, and it is there that the actual incineration of the garbage is accomplished. Behind this area there is a drying hearth upon which the wet garbage is deposited in such position that the hot gases pass under, through and over it, ensuring rapid drying.

DEPARTMENT OF OVERSEAS TRADE

His Majesty's government commissioner for overseas trade would like to get in touch with manufacturers' agents and others who wish to obtain the On-

I AM not bound to win, but I am bound to be true; I am not bound to succeed, but I am bound to live up to what light I have. I will stand with anybody who stands right, keep with him while he is right, and part with him when he is wrong.

—Abraham Lincoln

tario agencies of United Kingdom firms now or after the war, all with a view to the encouragement of British trade in Ontario and the elimination of enemy goods after the war and the sale of British goods in their place. Samples of German or Austrian merchandise sold here before the war, which can be spared by importers or agents, will be of great service to the above commissioner, Fred. W. Field, at his office, 260 Confederation Life Bldg., Toronto.

ELECTRIC STEAM RADIATORS

Rapid Radiators, Limited, 196 King street W., Toronto, is placing on the market a new electric steam radiator. It is claimed for these radiators that they will heat a room quickly and can be set up with a minimum of trouble. It is



"The Rapid" Electric Steam Radiator

also claimed for these radiators that they not only create heat but conserve it for suitable distribution, as the radiator circulates the heat on all sides in the same manner as ordinary steam radiators. No. 15 radiator is stated to weigh 50 pounds, using 660 watts in 10 hours. No. 20 radiator is stated to weigh 62 pounds, uses 880 watts, and the claim is made for it that it will heat a room 8 x 10 x 9 with one window and two sides exposed from zero to 70 degrees temperature. Ten feet of extension cord, socket and plug are supplied with each radiator. The heating element in each radiator is stated to be guaranteed for one year.

SANITARY ENGINEERS SHOULD ADVERTISE

(Continued from page 18.)

in their farm home. Said she: "We have a fine big car, 320 acres of land (most of it under cultivation), and several head of cattle; in fact we have everything but a bathroom, etc. Can you give us some information as to whether we can have a bathroom put into our home?"

After procuring further particulars the writer had the pleasure of laying out plans for a full equipment, and it transpired that this farmer had to sell his car to pay for the job, which he did. This is only one case where it simply meant a little education, a little salesmanship, etc.

The writer has often felt like stopping every farmer he met riding in an auto and asking him if he had a bathroom in his home. It sounds foolish, but there would be a good story for SANITARY ENGINEER if some member of the trade would do so and tell the Editor all about it.

VOCATIONAL EDUCATION FOR DISABLED SOLDIERS

THE Federal Board for Vocational Education has just issued the "Evolution of National Systems of Vocational Education for Disabled Soldiers," being Bulletin No. 15 of the series of this Board, of which Dr. C. A. Prosser is the director.

Coming at this particular time, when the problem of what will be done with our own wounded and disabled men is of growing interest to the country generally, the bulletin has the considerable value of timeliness, in addition to its intrinsic worth as the only complete exposition of what other nations are doing for their own, who are suffering disabilities as one of the fortunes of war.

There is, additionally, the value of being an absolutely authoritative publication, with material drawn from official sources abroad, and issued by the Federad Board for Vocational Education which, by unanimous vote of the Congress, has been charged with the high and great responsibility of re-educating and rehabilitating for vocational usefulness, the disabled men of the United States land and naval forces. The Federal Board has been engaged upon the study of war rehabilitation work since August, 1917.

The bulletin is a volume of 320 pages, illustrated with many photographs showing progress made in other countries in refitting men to take up again the battle of civil existence. It shows how science and the wonders of specialized reeducation are able to neutralize what would otherwise be serious handicaps that would place the subject thereof in the category of human junk.

It is a most inspiring message of hope and confidence to every man who is in the armed forces, and those subject to call, and the families and relatives of all of these men. It assuredly dispels any fear that a man may have of becoming a wounded or decrepit burden, either upon society, the state or his relatives. Mere remnants of men are shown who have been turned into useful wage earning, self supporting and self respecting citizens who supplement their pensions with well paid labor, and in many instances have larger revenues than before being injured.

The volume deals with the subject of rehabilitation generally, its principles, the attitude of the public toward the disabled man, and the outlook and viewpoint of the men themselves. It then takes up the various countries—France, Belgium, Great Britain, Italy, Germany, Austria-Hungary, Canada and other British Dominions.

Copies of this interesting and valuable document—the first the United States Government has issued upon this absorbing subject—may be had without cost, upon application to the Federal Board for Vocational Education, Ouray Building, Washington, D.C.

Here's a Bit of a Sermon

HE went one day to get a job, he had to earn some cash, to pay his laundry ticket up and square his bed and hash. He had his nerve ten feet in length, of chest he had a heap, he wasn't lackin' not a bit in big hunks of conceit.

He wasn't goin' to do a job where he would soil his fist, or cause a spot to camp upon the watch upon his wrist.

He didn't want to swing a pick, nor drive an Irish lathe, or be a sewer digger and camp within a cave. He wanted cash for all he did, of that there was no doubt, but he didn't want to get hooked up with too much work about.

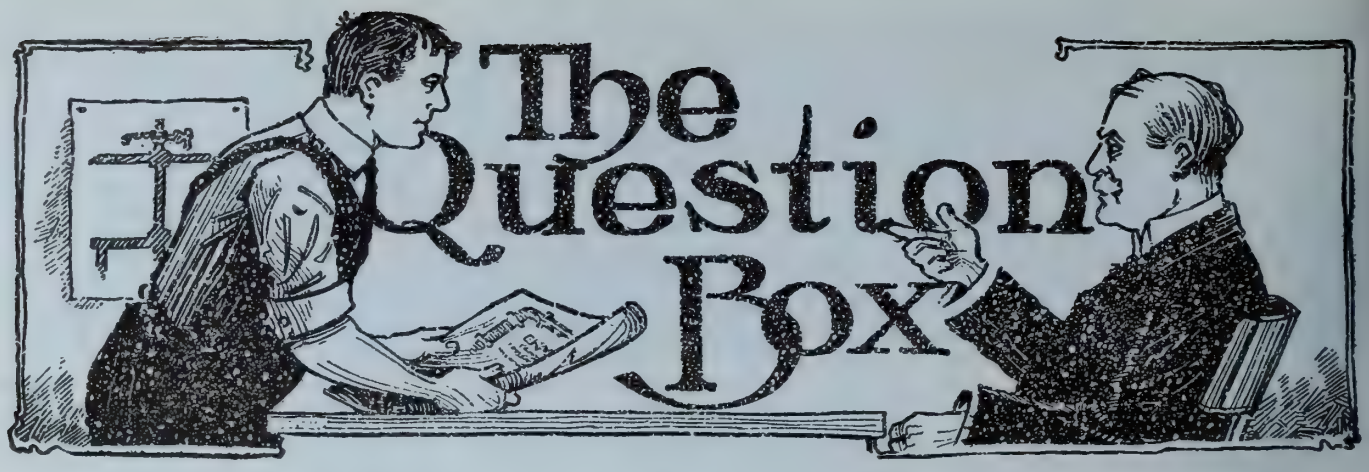
He knew about a drill he did, he knew about a file, the things he knew if stacked on edge would make up quite a pile.

He worked one year upon a farm, he used to drive a binder, he knew about a lathe, by gum, likewise about a grinder.

He'd seen a man who had a son, and this chap had been told about another friend of his who knew just how to mold. He'd often watched a smithy work about the dust and heat, and seen him nail the boots upon the Clydesdale horses feet, and so he knew about this job, he learned by observation, but not by rollin' up his sleeves and not by perspiration.

And every time he got a job he lasted half a day, they always reached to tie a can on this here reckless jay.

There's a heap of truth in this here yarn, if you will flop your ear, and dip your head across this way so you can't help but hear—don't try to jump around and make a hopeless, foolish dazzle, but pick one job and then, me boy, just lick it to a frazzle.—ARK.



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published--Description of Jobs Done or Shop Kinks Are Also Invited.

SYPHON STARTER

By J. E. Noble.

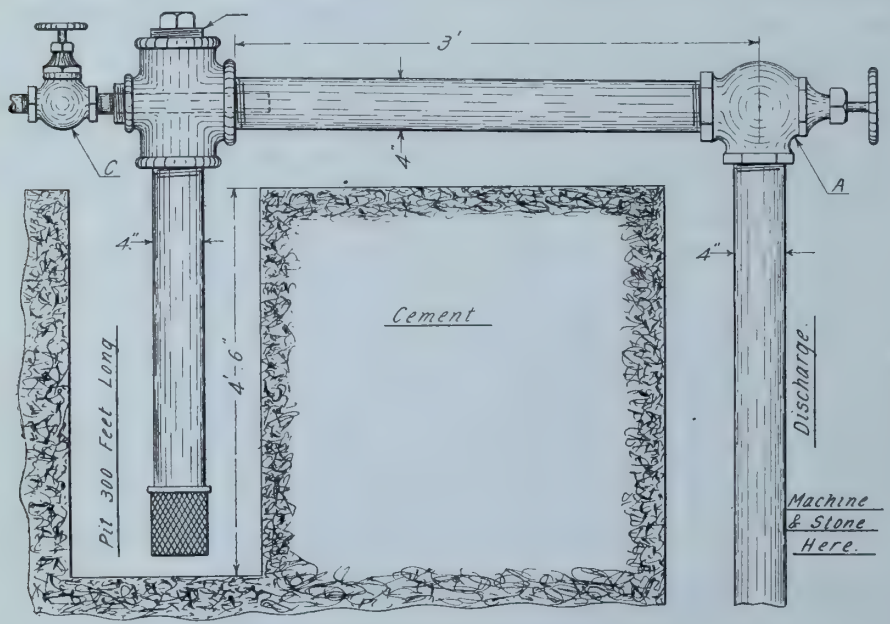
At the plant where the writer is employed there is a pit 300 ft. long and 4 ft. 6 in. deep, which receives a constant supply of strained sewage. After being treated with chloride of lime the sewage is syphoned into a machine, which travels back and forth the length of the building, i.e., 300 ft., being operated entirely by the syphoned water

During its travel the machine discharges the sewage in the form of a spray over a stone-filter bed, 5 ft. deep, which covers the entire floor of the building, 60 ft. wide.

About once a week the machine has to be stopped for flushing out with clean water, etc., and the syphon breaks when the pit is emptied. To start the syphon again the valve A (see sketch) would be closed and the air extracted by a hand air pump placed on the tee at B.

In time the valve A leaked; it was refaced, but soon started leaking again. This was repeated until the valve could not be refaced again. By this time the air pump was almost worn out. Even when valve A and the air pump were both new it required from 15 to 20 minutes quick pumping to get the syphon started.

A plug was therefore placed in the tee at B, and a hole drilled in the back of the tee to take in a ½-in. high-pressure steam pipe having a valve outside at C. The 4-in. leaking angle valve was left on at A.



Sketch of Arrangements for Startng syphon.

When the pit became full of water the valve C was opened and the valve A nearly closed, and inside of two minutes the syphon would start. The steam valve would then be closed and A opened wide

UNDERGROUND IRRIGATION

Editor, SANITARY ENGINEER. — I am cultivating quite a nice business from farmers in our locality and have installed a number of septic tanks and sewage disposal systems, and have taken the advice of SANITARY ENGINEER every time. I am not having any trouble with any work installed, so conclude that the advice given and acted upon is O.K.

There is one problem I would like to have advice from you on. It is this: Can a tank built upon similar lines as a septic tank be made use of along with underground field tile, laid in the same manner as if used for sewage disposal, be used for the purpose of irrigation? I know of several farmers whose truck gardens are so situated that the water drains off too quickly and when there is a dry spell the vegetables suffer for want of water at times. I would appreciate very much any information you can give me on this matter at an early date.

RURAL PLUMBER.

The above question should not only be of interest to the inquirer, "Rural Plumber," but to every member of the craft. No doubt a system of underground irrigation would be possible if an equipment similar to a sewage disposal system was put into use. The only difference, of course, would be that a tank with only one compartment would be necessary, with a syphon fitted therein in the usual way. If a 3-in. syphon was used the same depth of tank would be required, but the cubic contents would have to be determined according to the area to be watered. These data would have to be procured from an agriculturist. Possibly some of our readers have this information at hand, and if sent to the writer it would be published in SANITARY ENGINEER.

The next thing to determine would be the source of water supply to the tank and control of same. If the farmer has a large cistern to catch roof water this water could be pumped to a higher elevation and allowed to flow very slowly into the tank in which the syphon is located and the flow could be controlled by a valve so as to determine the period between each intermittent discharge.

There is one other point which should not be forgotten, that is the moistening

Continued on page 30



Compression Sink Bibbs

SIMPLE elegance, combined with superior strength and wearing quality, is what you give your customer when you install **MUELLER** goods.

The many advantageous features of **MUELLER** compression bibbs give maximum service from the bibb as a whole. The anti-spreading device that breaks up the whirling motion of the water and the corrugated stem and handle, allowing the handle to be set at any angle without becoming loose or wobbly, are only two of these features.

MUELLER Bibbs are the best the market affords. Write for prices.

H. Mueller Mfg. Co., Limited

SARNIA CANADA

MUELLER

THE QUESTION BOX

Continued from page 28

value of water when delivered to roots of plant life.

While a portion of the water would no doubt filter away lower in the ground there would not be very much loss by either evaporation or running off the surface as is the case when rain falls on the ground.

The sun's rays assist, however, in drawing the water to the surface providing the pipes referred to are not laid too deep. Just to show how much water is evaporated by the sun in certain districts, the following item taken from a recent issue of *Popular Mechanics* will be very interesting:

Sun Takes Great Volume of Water From Lake

Evaporation of water from Gatun Lake, Canal Zone, reached a new high record during the month of March, this year. Calculations show that the sun withdrew 3,248,000,000 cu. ft. of water from the body, the equivalent of 1,213 cu. ft. a second for the period of 31 days. This was one cubic foot a second in excess of the volume of water passing through the penstocks of the Gatun hydro-electric station, which, during the same month, produced 4,681,000 k.w. hours of energy. This in turn shows the loss of potential current due to the sun's effect.

NEW CANADIAN PATENTS

Continued from page 17

the valve, and operating means raising said valve member and constructed to have greatest leverage ratio thereto at the beginning of said valve opening, which ratio gradually decreases with the gradual raising of said valve member.

6. A valve seat, a valve member having means displacing water, thereby tending to buoy up said valve member when submerged, and variable pressure means opposing the gravity of said valve member, which opposition gradually increases with the gradual raising of said valve member and holds said submerged valve member raised when the valve is completely open, the aforesaid pressure means being overcome by the weight of said valve member and its attachments when the water level recedes sufficiently to diminish the aforesaid water displacement, thus closing the valve.

COST, THEN AND NOW

Continued from page 16

the fact that production could no doubt be very much increased at lower cost if one had a uniform plumbing code in operation.

If we as sanitary and heating engineers will only begin right now and work upon a uniform code of by-laws, both for plumbing installations and heating systems, we will certainly be doing a real service not only for our own people but for every one with whom we do business.

In a future issue we will take up the question of cost of heating systems.

MOUSE AS ENGINEER

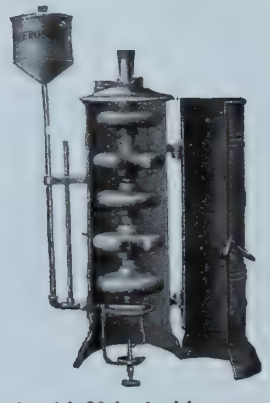
How a mouse dug a spiral groove round and round the inner surface of a hole into which it had fallen is described by an electrical engineer.

"We had dug holes for the poles of our new transmission line," says the engineer. "A field mouse tumbled into one of them, and was imprisoned during the night. Making my usual morning inspection of the work, I noticed the little fellow running around the bottom of the hole trying to find some means of escape. When I came back from my tour he had settled down to business. He was digging steadily a spiral groove round and round the inner surface of the hole with a uniformly ascending grade.

"At the end of two weeks the little engineer struck a rock too big for him to move. For nearly a day he tried to get round it, but without success. Then, with wonderful patience and unflinching courage he dug another pocket, reversed his spiral, and went on tunneling his way in the opposite direction. At the end of three weeks he was coming near the top. Morning came: the mouse had sped away, his spiral road completed."—*Irish Ironmonger.*

The Hotstream WATER HEATER

Kerosene Water Heater



(Also made with 20 ft. double copper coil)

Here is a REAL Kerosene Heater.
Heats as HOT and FAST as a gas heater.
Patented wickless burner generates its own gas and throws a clean, powerful, odorless flame. Will run 10 hours on a gallon.
Send for catalogue and folder.

The Hotstream Heater Co.

"Makers of heaters that heat"

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THE FOREMOST FORGER'S MASTERPIECE



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"A 'perfect' heating system."

That is the only description that can be given to the "Dodd Heating System"—eliminating, as it does, all the faults and shortcomings of the coal-fired boiler.

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Fired by gas (the cleanest of fuels); automatically controlled and regulated by a Thermostat. Constructed on scientific principles—fool-proof—and above all economical in operation, the "Dodd" is the ideal heater—it may be used wherever a hot-water, steam or vapor system is installed.

The owner of a Dodd Gas Heater has no furnace trouble—no cellar work.

To obtain heat, it is only necessary to light the pilot-light—set the Thermostat to the degree of heat desired—and leave the Dodd to do its work. It will "carry on" night and day—week in, week out—throughout the Fall, Winter and Spring, burning only sufficient gas to give the necessary heat.

We have faith in our product—a mighty faith. We have tested the Dodd Heater under all conditions—and can show you recording charts, fuel-consumption accounts, consulting heating engineers' certificates. Moreover, we are prepared to give a strong guarantee with every Dodd Gas Heater.

Your clients want to know about this perfect heating system—we want you to tell them all about it. In order to do this, you must investigate our claims—and understand our system. Spend a little of your time in making an investigation.

We will advertise this Heater extensively. You will be questioned by your clients—have your information ready. Be posted. Know the fine points of our system, so that you can talk it intelligently.

Co-operate with us in introducing to the public the ideal heating system—one that will bring you added prestige and substantial profit.

We will help you in every way possible—let us explain our sales plan.

THE DODD HEATING SYSTEMS LIMITED

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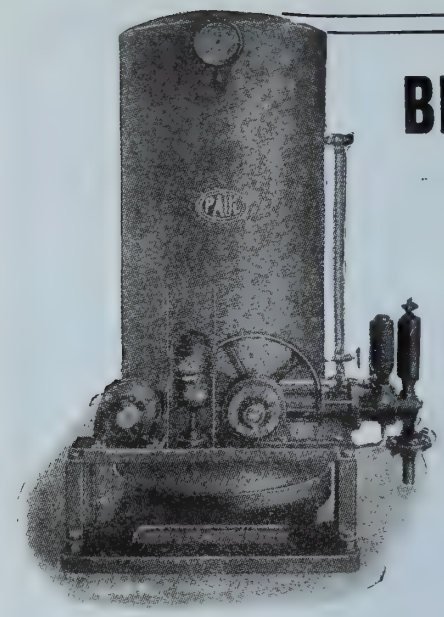


Fig 886
Complete Unit Water System Type F.
Electric Motor Pump

BE A BIGGER BUSINESS BUILDER

There's a better and bigger business for the sanitary engineer who hitches his plumbing job to a **"Paul."**

We challenge all comers for efficiency of service and durability. No trouble when once installed is the verdict of every one of our customers. That's more than can be said of most pneumatic water systems.

Remember This---

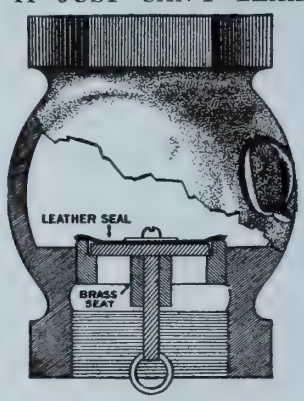
"Paul" Pump and "Hurley" Service pull repeat orders. They sell themselves.

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IT JUST CAN'T LEAK



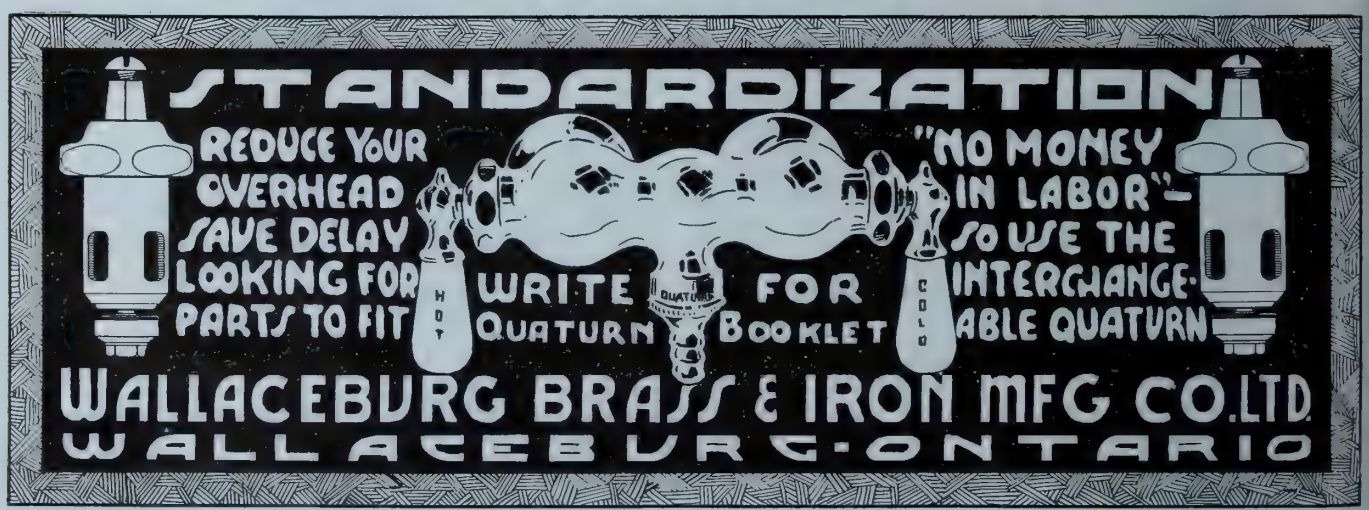
A SURE "Q" ER FOR PRIMING TROUBLES

A foot valve that just can't leak is one of the most important parts in a pumping equipment. Every person with any pumping experience will tell you that if the foot valve will not hold, the strain on the pump is doubly increased. In fact 50 per cent. of the efficiency of the pump depends upon the foot valve.

See that you procure a "Q" valve for every pumping outfit you install and priming troubles will be a thing of the past.

R. MACDOUGALL CO., LIMITED

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The Stack Can't Help Being a Best Seller Public Opinion Does It!

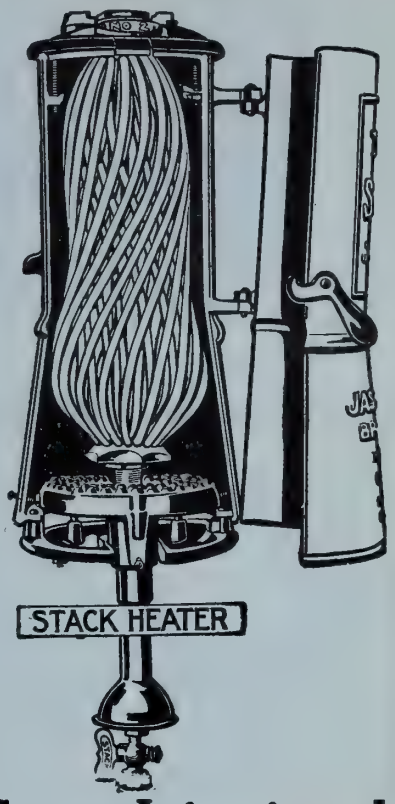
The STACK will heat 5 gallons of water 3 minutes quicker than the average heater.

The STACK raises the temperature of 5 gallons of water 28 degrees higher in 10 minutes than the average heater.

The STACK will heat 3 gallons more in 10 minutes than the average heater.

The STACK shows 15% greater efficiency than the average heater.

You'll sell more STACKS and make a larger profit on each sale. Try it.



James Morrison Brass Mfg. Co., Limited

93-97 Adelaide Street West, TORONTO

The Wrench of 25% Greater Efficiency

TRIMO PIPE WRENCH



Two new features have been recently added to the Trimo Pipe Wrench, namely Nut-Guards, in all sizes, and unbreakable steel frames, in leading sizes.

The Nut-Guards prevent the accidental rotation of the nut while in use.

These improvements add 25% to the usefulness of the tool.

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All Trimo Pipe Wrench parts are interchangeable.

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Nut with Nut-Guards

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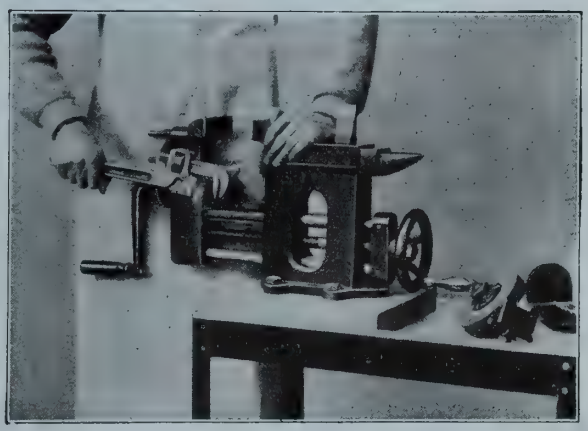
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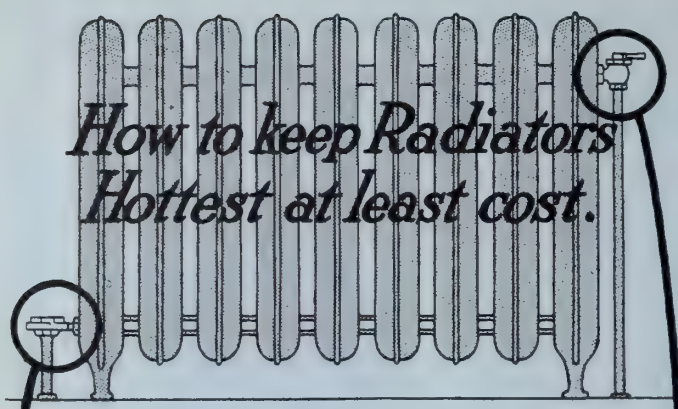
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We will supply you with fuel-saving equipment that positively does away with the causes of heat-waste in radiators—air and water. We will help you plan new work or change-over work and then lend our aid in starting the installations properly.

This is the kind of co-operation that counts.

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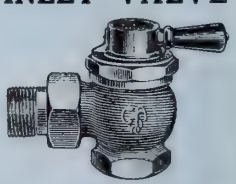
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This device allows the water and air to escape and keeps *in* the heat.

To get a quick start on this profitable proposition, write for full details today.

THE DUNHAM PACKLESS INLET VALVE



This unit regulates the flow of heat into the radiator.

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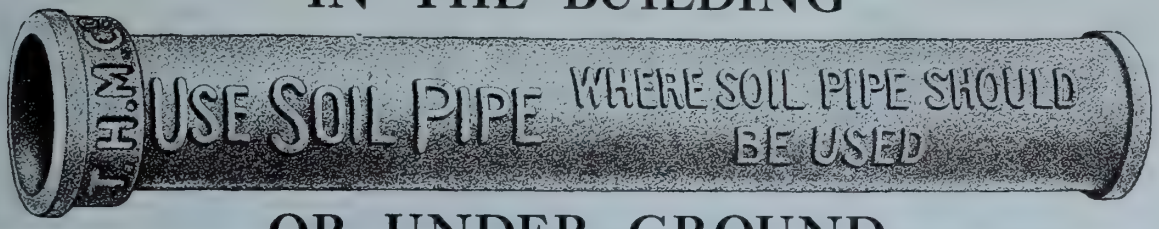
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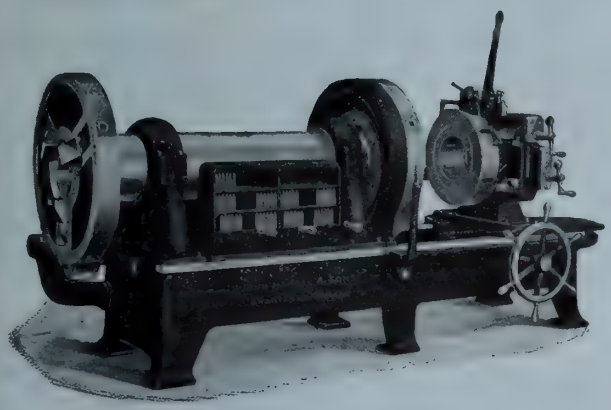
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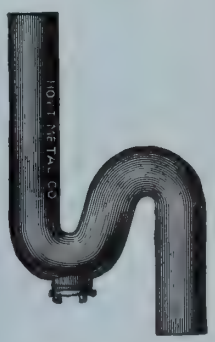
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Beaton & Cadwell Mfg. Co., New Britain, Conn.

Radiator Traps (Steam).
Canadian H. W. Johns-Manville Co., Toronto.
C. A. Dunham Co., Ltd., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

Range Boilers
Toronto Hardware Mfg. Co., Toronto.

Reducing Pressure Valves.
C. A. Dunham Co., Ltd., Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

Roof Flanges and Flashings.
Canada Metal Co., Toronto.
Simplex Manufacturing Co., Chicago.

Rubber Goods
Canadian Consolidated Rubber Co., Ltd., Montreal

Septic Tank Valves and Syphons.
Anthes Foundry Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

Solder.
Canada Metal Co., Ltd., Toronto.
Hoyt Metal Co., Toronto.

Second-Hand Pipe
Consumers Metal Co., Ltd.

Steam Specialties.
Dart Union Co., Ltd., Toronto.
C. A. Dunham Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Kerr Engine Co., Walkerville, Ont.
James Morrison Brass Mfg. Co., Ltd., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

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James Morrison Brass Mfg. Co., Ltd., Toronto.

Testing Plugs.
James Morrison Brass Mfg. Co., Ltd., Toronto.

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Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London and Toronto.
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H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Trimont Mfg. Co., Roxbury, Mass.
Williams, J. H., & Co., Brooklyn, N.Y.

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Dart Union Co., Ltd., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

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C. A. Dunham Co., Ltd., Toronto.
Moline Heat, Moline, Ill.

Vitro Tanks.
Galt Brass Co., Ltd., Galt.

Vacuum Systems of Heating.
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And Save Fuel

Drive These Facts Home
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The thin waterways in the "King" mean quickly heated water, perfect circulation, and a SAVING IN FUEL.

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WROUGHT PIPE

BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.
All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES

Black and Galvanized
All Sizes

Ask your jobber for CT Brand

CANADIAN TUBE & IRON CO., LIMITED

Montreal Works: Lachine, Can.

PIPE AND THE PUBLIC WELFARE

By R. C. McWANE

A Book Just Off the Press

Every sanitary engineer should be the possessor of this book. It deals with pipe-making of all kinds, cast iron, wrought iron, steel, wood and tile pipe. It is valuable because it gives the users of pipe a true idea of how pipe lasts under various conditions when in service.

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FIG. 141
JENKINS BROS.
Standard Pattern Iron Body Globe Valve Screwed with Yoke.

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Because—

Since 1864 Jenkins Bros. Valves have acquired a wide reputation for quality and trustworthy service in holding steam, oils, acids, water and other fluids in places where other valves do not "make good."

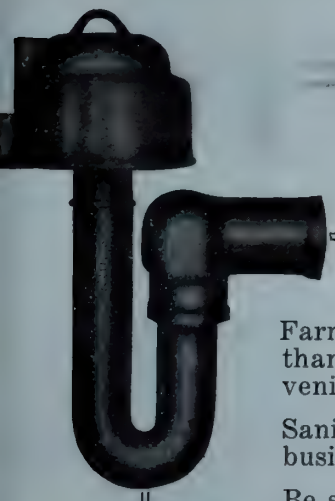
If a genuine Jenkins Bros. Valve does not keep perfectly tight in a bad spot where other valves cannot be kept tight you may return it and we will promptly refund your money. Stocks at all dealers.

Catalogue No. 8 free on request.

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Time to go out *Strong after Rural business!*

Farmers were never in better financial condition than just now. More than ever are they willing and ready to spend money on home conveniences.

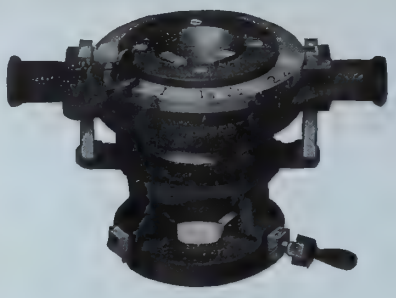
Sanitary Engineers should therefore go out strong NOW for this rural business while opportunity and weather conditions are ideal.

Be sure and specify the permanent and reliable "Anthes" Syphon and Soil Pipes. You'll secure future business in that neighborhood because of service rendered. Anthes has no superior for permanence, quality and price.

Specify "ANTHES" line from your jobber.

ANTHES FOUNDRY LIMITED.

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PIPE THREADING AND CUTTING TOOLS

One Man Can Thread up to 12 Inch.



You cannot afford to expect your men to make horses of themselves. If they did they could not keep it up. Our tools save time, do better work and makes life worth living for your men.

Cuts Without Burring

No. 1 cuts from ⅛″ to 1″
No. 5 cuts from ½″ to 2″
No. 10 cuts from 2½″ to 4″
No. 15 cuts from 4″ to 6″

Ratchet	Geared
No. 6—¼″ to ¾″.	No. 41—2½″ to 4″.
No. 25—1″ to 2″.	No. 61—2½″ to 6″.
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Our No. 15 style narrow flange designed for the Canadian trade.

One of many styles

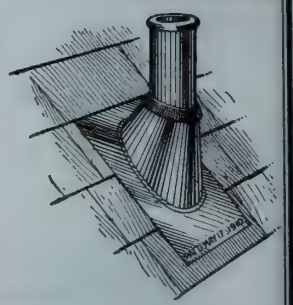


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Handsomely nickel-plated or plain Sizes ½ to 2″

Stock now carried by our Canadian Representative
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The SIMPLEX
Adjustable
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Fits any roof from ½ pitch to flat—just slide it down the pipe and it will conform with the pitch of the roof.

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1-2″ to 4″
Black and Galvanized
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Works: LACHINE, QUE.

"HAUSE" PIPE JOINT CEMENT

For steam, water, air, oil, gas, gaskets, etc. The cement that cements. Sets like gum. Allows no leaks.

The Great Value of "HAUSE PIPE JOINT CEMENT" lies in its peculiar chemical properties which permits of its hardening and expanding after the joints are made up. In making up joints it has the same effect as a lubricant on the best graphite, and while the joints may be made and broken readily, a perfectly tight joint is maintained at all times. Comes in 1-lb., 5-lb., 15-lb., 25-lb., 50-lb. cans, 100-lb. barrels. Manufactured in ready mixed and powder form. Ask your jobber for prices, or write us direct.

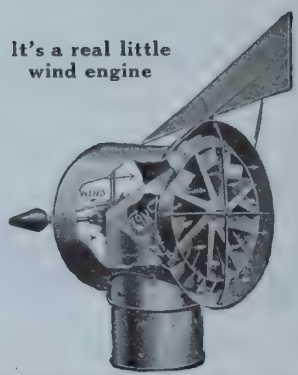


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Made in Omaha, Neb., U.S.A., by
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THE BICALKY

It's a real little wind engine



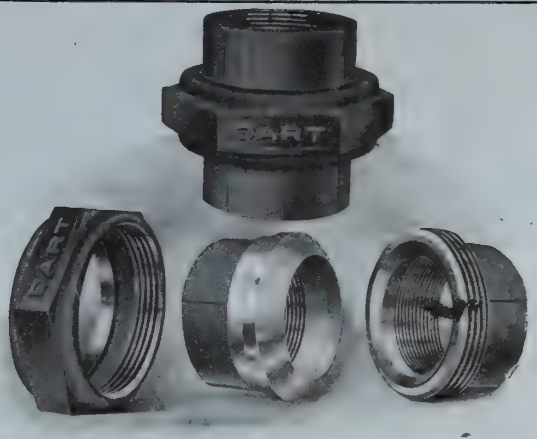
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The "Bicalky" will dispense with all auxiliary heaters on local ventilation systems.
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There Are Lots of Gate Valves

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but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.
Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.
Approved by the Fire Underwriters' Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

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All this you give to your customer, and pay no more than you would for less "perfect" goods, and we stand behind every piece, which means extra protection for both you and your customer.

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Any article of our make proving defective through inferior metal, or improper workmanship, on our part, will be replaced with TWO good ones, at NO CHARGE to you.

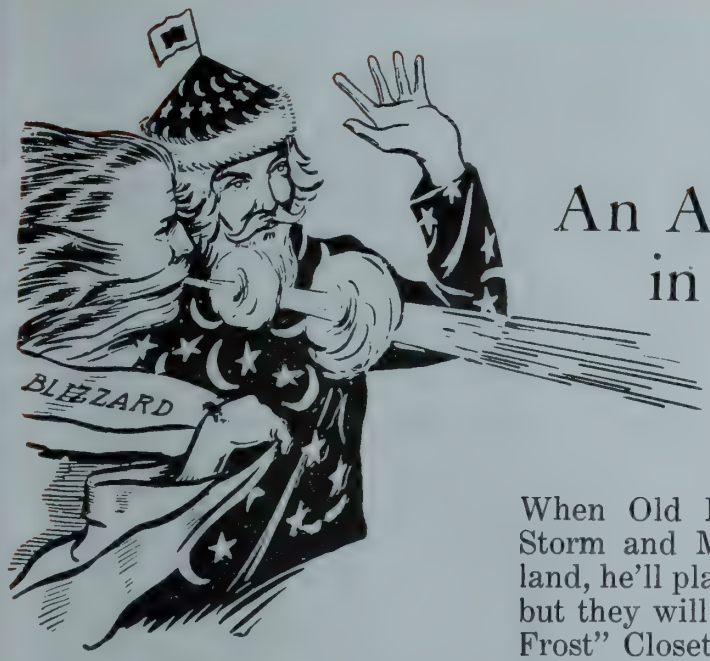
CAN YOU BEAT IT?

Galt Brass Company, Limited
Galt, Canada

SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

ol. XII Publication Office, Toronto, August 15, 1918 No. 16



EMPIRE

"Jack Frost" An Anti-Freezing Closet in the Fullest Sense of the Word!

Works Automatically

When Old King Winter, accompanied by General Storm and Mr. Blizzard, comes roaring through the land, he'll play havoc with most unprotected plumbing, but they will attack in vain the New Improved "Jack Frost" Closet.



Valve controlling flush to hopper is independent and operates at a right angle with the supply valve. Same is closed by ball-bearing knob coming in contact with cam or seat.

When the mainspring raises the seat, the flush valve is opened by the force of water, assisted by a small exposed spring. Adjustable mainspring is mounted in open cage on top of valve. Tension of spring can be adjusted to suit water pressure by regulating speed and lock nut. All parts are so arranged as to draw free from water, which prevents freezing.



Get in touch with us re prices in time for Fall trade.

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A Beaver Brand Pedestal
is a Lavatory Fixture Worth While



A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for BEAVER BRAND CAST IRON ENAMEL WARE

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DOMINION
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No matter what your rubber need may be, it can be supplied to the best advantage through the Dominion Rubber System. Our experts are at your service to give advice and to show you how to get the best results in the use of rubber as applied to your particular need.

The service of a Dominion Rubber System expert is free to those who will write our nearest branch.

Canadian Consolidated Rubber Co., Limited

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After Vacation Time Comes Fix-Up Time

Wolverine Bath Room Fixtures

Remember

Bath Room Fixtures Well Displayed are half sold,

therefore

Do not wait until too late in the season before placing order—have the goods and a satisfied customer.



will be in

Great Demand

Why not lay in a stock and be prepared?

Complete line listed in

Catalog "C"

Write for Prices

Canadian Chatham **WOLVERINE** **Company, Ltd. Ontario**

PIPE THREADING TOOLS

It is Evidence Like This



"Toledo" Geared Adjustable Threading Tool No. 2 making a cut and thread on a 4-inch bend in position. It was desired to install a steam separator above throttle of engine, and the whole job was satisfactorily completed without removing the pipe line.

which proves the extra value of "Jardine" and "Toledo" Pipe Threading Tools

"Jardine" and "Toledo" Pipe-Threading Tools cut clean, sharp threads with a minimum of muscular effort. They permit of one man doing work which ordinarily requires two. But even more important than this, they will work in any odd corner. Instance the job illustrated in the accompanying engraving. Here is a case where, with an ordinary tool, the whole pipe line would have had to be taken down. The tool paid for itself on that one job.

Investigate "Jardine" and "Toledo" Tools yourself. Ask us to send names of users in your locality. Then go and talk to these men in your own business and learn what they think of these good tools.

A. B. JARDINE & CO., Limited, Hespeler, Ont.

Sole makers of "Jardine" Pipe-Threading Tools.
Sole licensees to manufacture and sell Toledo Pipe-Threading Tools in Canada.
Agents, Winnipeg and West—Stanley Brock, Ltd., Winnipeg, Man.
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A War-Made Opportunity

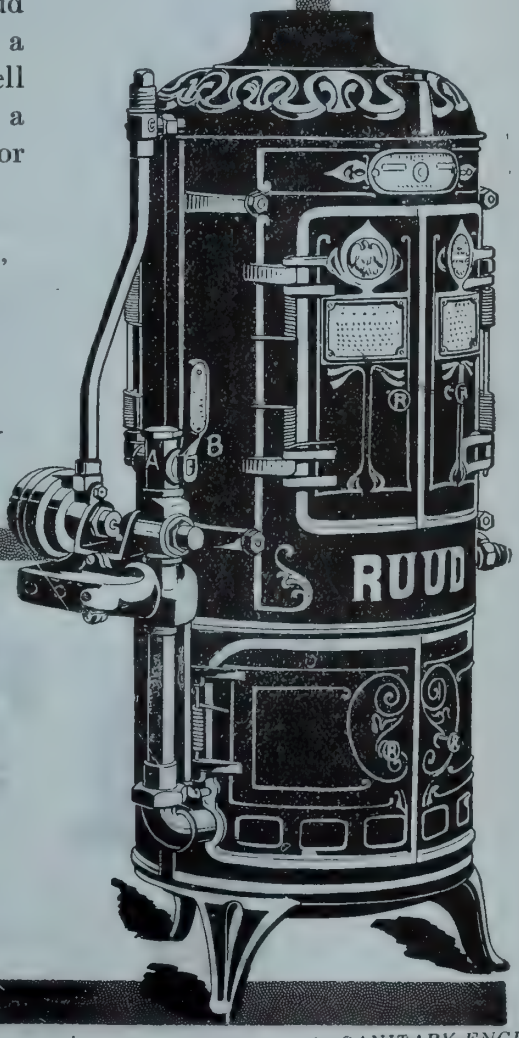
RUUD Quality of materials and workmanship has built the largest water heater business in the world. This quality has been kept up for twenty years. It will never cease to be the Ruud watchword. It has made the Ruud line of Water Heaters the most popular — and the most profitable for any plumber to handle.

The war has opened the way for you to engage actively in the clean, straight proposition of merchandising and installing Ruud Water Heaters. You can make them your mainstay during 1918, or until all nations are at peace and we return to normal building activity. When this happens you can *go on* making Ruud profits permanently, for your *selling* activities will have become a regular part of your business, yielding a steady and satisfying income.

Ruud service is available in all American cities where gas is available. The Ruud Line of Water Heaters is the most complete — a type for every building, every purpose, every purse. Ruud literature is the most complete in both a technical and an educational way. Sell Ruud Water Heaters for profit, that is a war-made opportunity. Write today for particulars.

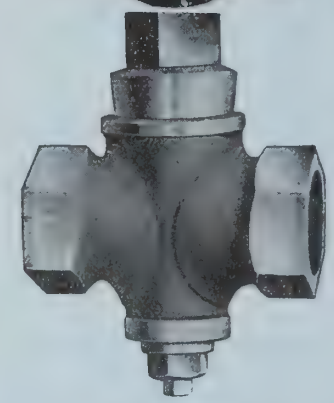
Ruud Instantaneous Automatic Water Heaters,
Ruud Multi-Coil Storage Systems,
Ruud Tank Water Heaters,
Ruud Automatic Shower Valves,
Ruud Garbage Incinerators.

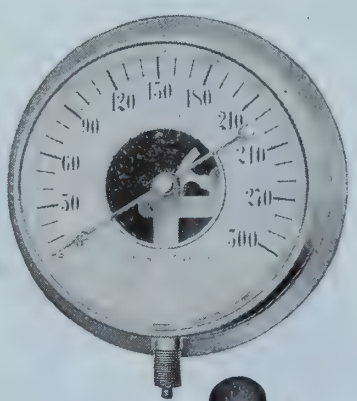
RUUD MANUFACTURING COMPANY
371-381 Adelaide Street West Toronto, Can.

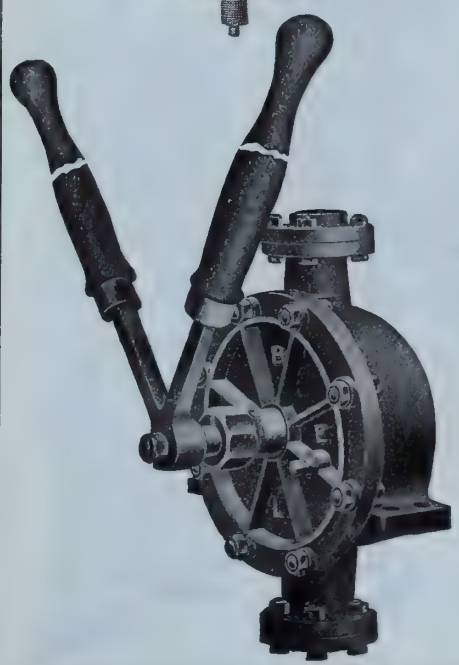


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AUTOMATIC GAS WATER HEATER









FIVE WORKS—OVER 3,000 EMPLOYEES

It is our intention after the War to devote our energies to the intensive production of the following Specialities:

Gunmetal and Brass Valves and Cocks.
Steam, Water and Compressed Air Fittings generally.
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Pressure and Vacuum Gauges.
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"Stella" Brand Alloys, Manganese Copper, Silicon Copper, Ferro Zinc, Phosphor Copper and Tin, etc.

Business After the War

If you are interested in any or all of the lines mentioned and are in a position to take a hand in the energetic distribution of the same, please communicate with us NOW to our Head Office at the address below.

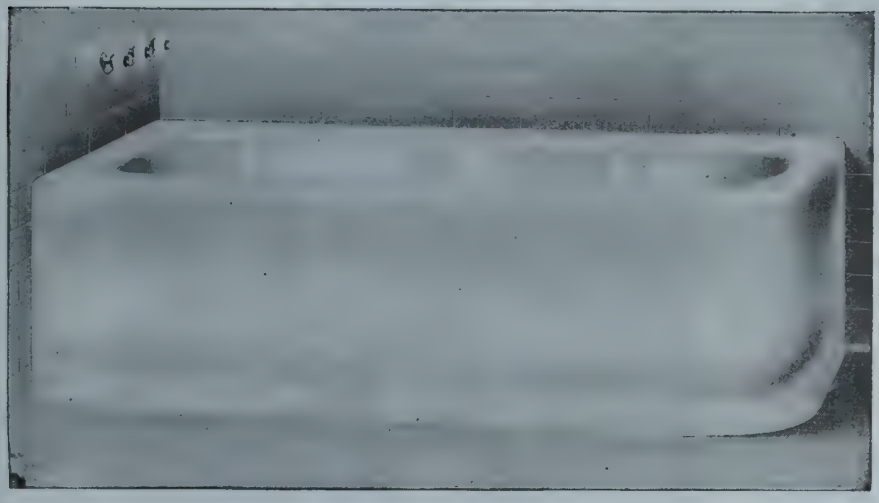
UNITED BRASSFOUNDERS and ENGINEERS, Limited

EMPRESS FOUNDRY

Cornbrook, Manchester, England

"Standard"
"Perfection" Built-In Baths

Made in One Piece Enamelled All Over



These Baths represent the last word in design and finish, and are made to build into Right or Left Hand Corner or into a Recess.

The "Perfection" Built-in Bath is only 17½ inches high, therefore convenient. It builds into walls and floors, the absence of all dust-collecting cracks and corners, meaning bathroom sanitation.

Made in 5 and 5½ foot sizes.

Illustrations on request.

Write the nearest dealer.

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THE CANADA METAL CO., LIMITED

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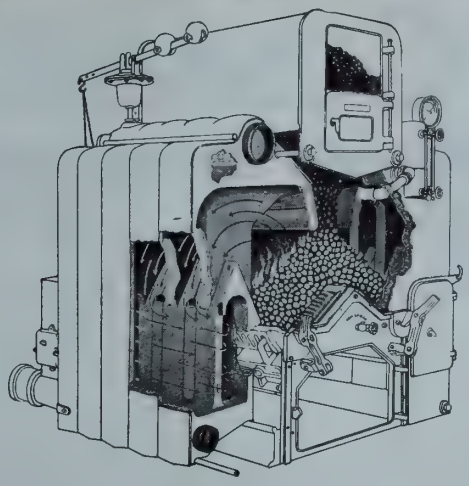
MONTREAL BRANCH
50 BRENNAN STREET

Within the Charmed Circle of "Bigger Business" Products

You'll find Canada Metal Products wherever progress is a "by-word." With consumer and dealer alike, Canada Metal Products are within the charmed circle of Bigger Business Products.

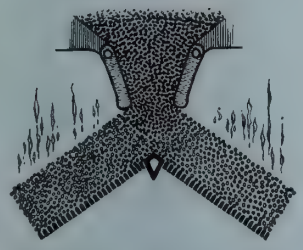
EVERYTHING FOR THE PLUMBER

BATHS, LAVATORIES, SINKS, ARISTOCRAT LAUNDRY TUBS, LEAD PIPE, SOLDER, BLOCK LEAD, SHEET LEAD, Etc.

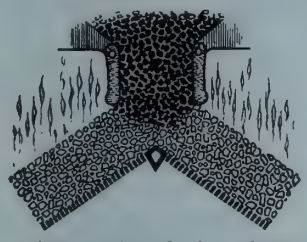


Large size Newport opened up so you can see for yourself, the Adjustable Throat.

More About The Newport Magazine Feed Boiler



Feed throat adjusted for buckwheat or pea coal.



Throat widened for chestnut coal.



Throat opened out wide for egg and stove coal.

The Burnham Boiler Line now includes a Magazine Feed Type of Boiler—The Newport. It is the *only* Magazine-Feed type of Boiler that can burn any size coal—from buckwheat to egg or stove.

It can do it, because it has an adjustable Water-Cooled Throat, with which the size of the feed opening can be varied to suit the size of the coal used.

Being able to use *any size* of coal, or coke, is one of the strongest kind of strong points in its favor.

Any coal you can get, high or low grade, you can burn. And burn economically.

Its Magazine is extra *large sized,* making it unnecessary to coal more than once a day in the coldest weather; and but two or three times a week during ordinary weather.

The Newport has 23 distinctive features, each one of which "does its bit" toward making it burn less coal, and require less attention.

By "less coal" we mean just that.

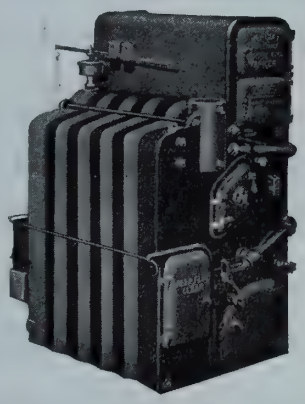
If we told you right here, *"how much less,* you would say we were "putting it on pretty thick." Any time, however, you really want to know, the figure facts will promptly be yours.

The Newport unfailingly "made good" all over the country during the record-breaking cold snap around the first of the year.

It is adapted equally well for Steam, Vapor, Vapor-Vacuum or Hot Water Heating Systems.

Send for full particulars.

See about selling it.



Single side Newport. Made this way in the smaller sizes.

Lord & Burnham Co. Limited of Canada

(Boiler Department)

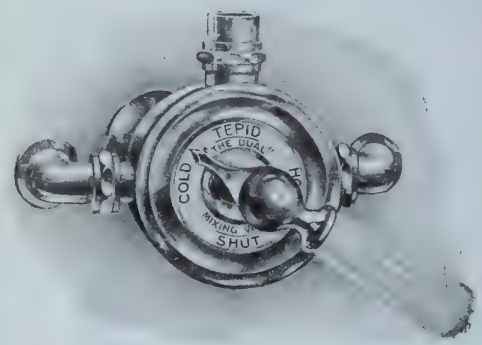
ROYAL BANK BUILDING, TORONTO

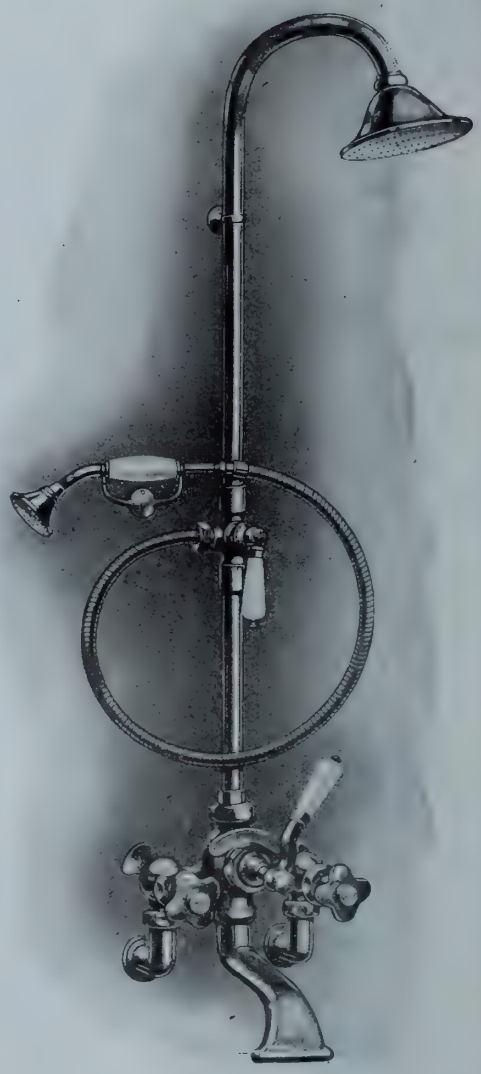
Factory : St. Catharines, Ontario

G. & W. G. GUMMER, LIMITED

EFFINGHAM BRASS WORKS, ROTHERHAM, ENGLAND

And at
9 Fenchurch St.,
London





"Dual" Mixer

A valve that really mixes Hot and Cold Water, and maintains a uniform mixture.

For ease of operation, simple construction and easy installation, it has set a new standard of efficiency.

Cold Water must be turned on first, no possibility of scalding.

Made in several forms for Showers, Sprays, Operating Rooms, etc.

At the well-known works of Messrs. Brunner, Mond & Co. these valves provide baths for 2,500 employees.

G. & W. G. GUMMER, LIMITED

Manufacturers of every description of

Engineers,' Plumbers' and Sanitary Quality Brassware

DIG out your old 1917 ledger and make a list of the homes in which you repaired tank heaters during the year.

Almost all of these homes can afford an Automatic Water Heater, and it's a safe bet that you can sell them a

"Pittsburgh"

You're as good and maybe better than the average salesman. You can't tell until you try. Do not wait for the business to come to you. You can make more money by selling and installing one "Pittsburgh" than you can make on ten odd repair jobs.

If you would like us to circularize your prospects with our educational advertising literature before you call on them, send us your list–we are only too glad to help you make some money.

PITTSBURG WATER HEATER CO.

Canadian Warehouse: 124 Richmond St. W., TORONTO

DISTRIBUTORS;

WINNIPEG	MONTREAL	TORONTO	CALGARY
	99 Drummond St.	12 Queen St. East	



"It Can't Be Done"

You can't keep prices in your head these days
The question for you to decide is:

Do you want to waste your time searching through invoices and telephoning the wholesaler to find out costs and then spend some more time figuring out what you should charge the customer OR are you satisfied to pay us $3.00 per month to supply you with suggested selling prices on all standard plumbing goods?

Figure It Out This Way

Supposing you spend six or seven hours a week on this work: is it profitable or would it pay to pay us about seventy cents a week for the same work?

We Can Do This Work Better

This is not an idle boast, it stands to reason that when we are making a business of it we will naturally be in better touch with the markets than you are. Furthermore, the average customers' complaint of overcharge can be handled better if you show him a printed price list that is being used by about 200 of the best contractors in the country. One customer says he wouldn't be without it if it cost $20.00 a month.

Order Our Price Service For One Year—Try It Out!

The Henderson Business Service, Box 123, Brantford

HOYT METAL GOODS ARE KNOWN

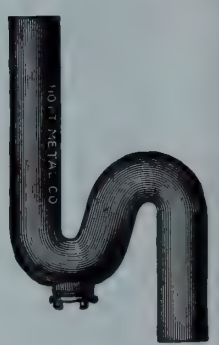
FROM COAST TO COAST



As time-savers there are none equal to our Wiping Solder, Bar or Wire Solder.

Hoyt Lead Traps, bends and waste pipe are in a class by themselves.

All our products are made to formula.

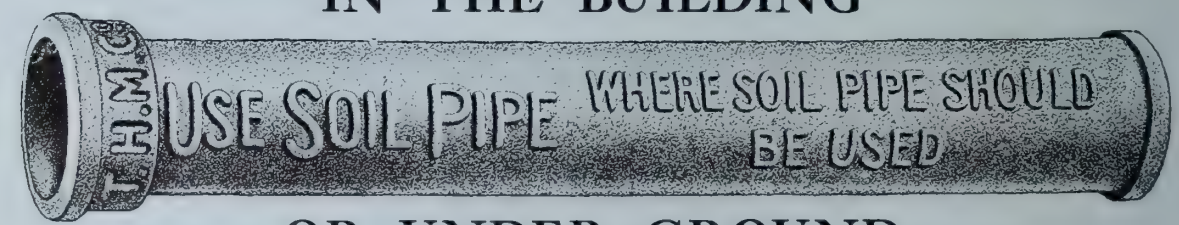


Our Mixed Metal Sales Amount To Over $5,000,000 Annually.

Write your Jobber **HOYT METAL COMPANY, TORONTO, ONTARIO** ***Write Us***

New York, N. Y., London, Eng., St. Louis, Mo.

IN THE BUILDING



OR UNDER GROUND

ASK YOUR JOBBER FOR T.H.M. CO. BRAND OF SOIL PIPE AND FITTINGS.

TORONTO HARDWARE MFG. COMPANY, - Toronto, Canada

WE MANUFACTURE A FULL LINE OF HIGH-GRADE RANGE BOILERS

Lowering the Cost of Getting Orders

THEY were talking about the high cost of getting orders—were Brown and Jones. They were agreed on some things: train service was interfering with ability of salesmen to call on as many as formerly; hotel bills were adding heavily to the weekly expenses of salesmen; congested freight and express service was interfering with quick deliveries; salaries of men were going up; labor of all sorts, as well as materials, was becoming higher-priced.

Then Brown said: "I am giving a good deal of thought to the training of my salesmen. I am endeavoring to make them produce more business—to sell more goods, and to reduce the number of futile calls. I notice that they are giving much attention to this subject in the United States, and that in Canada some firms are paying serious attention to this matter of better salesmanship."

"What are you doing?" said Jones.

"Well, I haven't done a great deal so far, for I am in the initial stages of my studies. But one thing I have learned: it is that my men haven't been analyzing the causes of their failures to make sales. I can't blame them, for I myself haven't troubled myself to dig into this phase of the selling game. Now I am asking myself and my men—Why the failure to get the order?

"I have discovered a good deal. One thing is that my men haven't known enough about the goods they took out to demonstrate them convincingly. This is largely our fault. So we are using time and printed matter to make our men know exactly what they have to offer.

"Another thing we have had impressed on us is that our men haven't been approaching their prospects always in the best way. They have been too keen to sell rather than to serve.

"I saw a thing the other day that is good—by a man named Casson. He said the average salesman's method was 'Talk—Argue—Compel.' As against this, he recommended: Listen—Agree—Oblige.

"What he means is that the salesman must get on the side of the buyer if he is to have best results. And so I am doing something to get my men trained to acquire the point of view of the man they canvass—this first. When a salesman postpones his sales talk until he has won the interest and attention of the prospect, he is in a much more favorable position to put across his proposal.

"I read recently an advertisement of the FINANCIAL POST in which it told of Frank Mutton, President of the International Business Machines Company, in which he said that he has subscribed to THE POST for each of his salesmen in order that they may be well informed about business conditions and affairs in Canada—this as an aid in making sales. The idea, I infer, is to make his men quick to get the point of view of the men they are to canvass—to become possessed of a kind and amount of information which will enable them to make themselves interesting to prospective buyers of time-recording machines.

"Now, I have known Mutton for many years—known him to be a super-salesman. In subscribing to THE POST for his salesmen, I saw one of his methods—secrets, if you like. So I got THE POST myself to see how my men could make use of it for the same objects.

"I have subscribed to THE POST for 4 months at the cost of a dollar per salesman, and I have been having my men report to me in writing just how they are finding THE POST useful to them. They read THE POST with one question uppermost: What item or article in this issue can be used by me to help me make sales?

"I want to tell you, Jones, that I am delighted with the experiment. The minds of my men have been stimulated. They are 'cashing in' on what they read. They relate certain items or articles to certain prospects, and they are approaching their customers with greater confidence, greater art, and with more persistency, born of a surer knowledge of how our product is worth the other man's consideration and purchase.

"My men are bringing in more business, and this offsets the increasing costs of going after business."

* * * *

A VERY suggestive conversation, is it not? The point of its reproduction here: If you think the idea put into operation by Brown (and Mutton who is paying for 50 subscriptions for men in his employ) is worth your consideration, then investigate THE POST for yourself. Instruct us to send THE POST to you that you may investigate it from the angle —What is there in this paper that my men can use to help them "get next" their prospects with a view to making more sales and in quicker time?

So we suggest to you that you sign the coupon below.

Just what does THE FINANCIAL POST aim to do? The answer is: It gives business men information about every important happening in every part of Canada as this happening relates to Business. It follows the various listed and unlisted securities, and gives each week clear and accurate and up-to-the-minute information about them. It tells about the movements and influences affecting such groups of investment interests as Iron and Steel, Textiles, Milling, Pulp and Paper, Transportation, and so on. It has numerous contributed articles of first-class interest and importance. It contains much personal matter—notes and sketches about men of influence or position in the public eye whose doings or sayings have relation to Business. Withal, THE POST is extremely readable. It is edited and prepared by trained journalists—the highest-priced staff of men on any publication in Canada. All this makes THE POST a "different" paper, and a good one. The subscription price is $3.00 (52 issues — Saturdays); or 4 months for one dollar.

The MacLean Publishing Company, Ltd.,
143-153 University Avenue, Toronto.

Send me / us THE FINANCIAL POST (weekly, every Saturday). Subscription price of $3 will be remitted on receipt of invoice in the u sual way. Have it addressed to

.....

S E. .....

Fifty Subscriptions from One Firm

THE International Business Machines Company, of which Mr. Frank E. Mutton is vice-president and general manager, subscribed to 10 copies of THE FINANCIAL POST some months ago—these copies to go to their travelling salesmen. Now this company has increased the number of these subscriptions to 50 because the results of the experimental subscriptions have proved so satisfactory.



FRANK E. MUTTON

Mr. Mutton explained that the object of putting THE POST in the hands of the men of his company was to keep them intelligently acquainted with general business conditions in Canada. He said he knew no better paper than THE POST for the purpose. It would seem that his men have responded fully to effort made to keep them well informed about Canadian business affairs—so much so that the management have added 40 other men to the original 10 to receive THE POST.

When Mr. Mutton was with the National Cash Register Company as its Canadian manager, he was the king of all managers in the matter of sales records. In this position he achieved a big reputation built on solid achievements. He learned salesmanship in a school where competition was of the hottest kind, and where the competitors were brilliant men. Giving Mr. Mutton full credit for superior personal qualities and energy of the most ardent kind, it is taking nothing away from him when it is said that not a little of his success was due to his intimate and sympathetic knowledge of the other man's business. And he taught the men associated with him as salesmen to know the point of view and requirements of the men they called on to sell machines to.

As vice-president and general manager of the International Business Machines Company, Mr. Mutton is putting into operation an idea used by him in past days with brilliant results—he is causing his salesmen **to know the business and requirements of their prospective customers.** To establish points of contact swiftly and surely is one of the open secrets of successful selling.

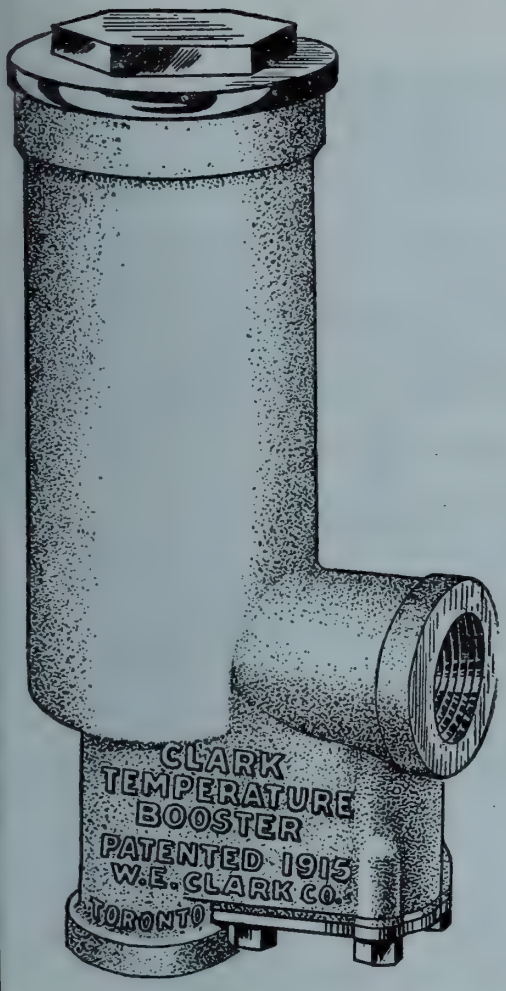
In the case of **your** solicitations of customers and desired customers, it is excellent strategy to have your salesmen so well informed about business conditions generally, and about the interests of the men they canvass, that they will be able almost instantly to relate their proposals to the interests of the buyer. When a salesman shows himself intimate with the interests or business or objectives of the man whose order he wants, he is immensely strengthened as a salesman, and his percentage of successful canvasses goes steadily up.

Our definite suggestion to you is: Subscribe to THE POST yourself, and learn from its pages how your salesmen or executives can draw power from this newspaper. Then, having acquired the sought-for knowledge, subscribe to THE POST for each man in your service who can profit you by knowing what is in THE POST each week. If Frank Mutton and other prominent executives are making a success of THE POST as a salesman's aid, it is reasonable to suppose that other managers of salesmen and executives can likewise employ THE POST as a producing agent. And so we ask you to sign and forward the coupon below.

- - - -

INCREASE YOUR PROFITS

SAVE COAL



There's more selling points about the Clark Booster, than any so-called heat generator on the market, because, in the first place, it does not generate heat, but it makes the coal transfer more heat to the water than could be possible unless a Clark Booster is fitted to the heating system.

It has fewer parts than any other appliance made for the purpose of increasing temperature in hot water systems.

It is easily taken apart and put together again, and every part can be removed without it being disconnected from the system.

It is easier installed, can be fitted to any system in two hours' time, and requires only a few cents' worth of fittings, and is absolutely fool-proof.

No material in its make-up that can corrode, which cannot be said of most heat generators.

ONLY TWO VALVES NO SPRINGS

No mercury, no rubber washers or fibre that can be damaged, all bronze to bronze, and made right.

Every jobber in Canada handles the Clark Booster because there's no come-back, no trouble, no complaints to rectify. Every Booster we sell is pertect when it leaves our factory and is fully guaranteed to increase the temperature 15% to 20% over a straight gravity job.

Write your jobber or write us. It's all the same to you or us.

GALT BRASS CO., LIMITED

GALT, CANADA

Sanitary Engineers—

DURING YOUR VISIT to the Toronto Exhibition make our Exhibit your head-quarters. You will find it a very convenient meeting-place, easy to find right at the south-west entrance of the Process Building.

The Company's representative will be glad to meet you and renew old acquaintances, and exchange information that will be mutually profitable.

The new lines of enamelware we are showing, suitable for Apartments and the types of houses now in demand, will also be very attractive.

Port Hope Sanitary Mfg. Co., Limited

Factory:
PORT HOPE, ONTARIO

Head Office:
ROYAL BANK BUILDING, TORONTO

TORONTO SHOWROOMS
119 King St. East

WINNIPEG OFFICE
405 Tribune Bldg.

MONTREAL SHOWROOMS
234 Beaver Hall Hill

When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER.

SANITARY ENGINEER

VOL. XII. AUGUST 15, 1918. No. 16.



(Continued from August 1st issue.)

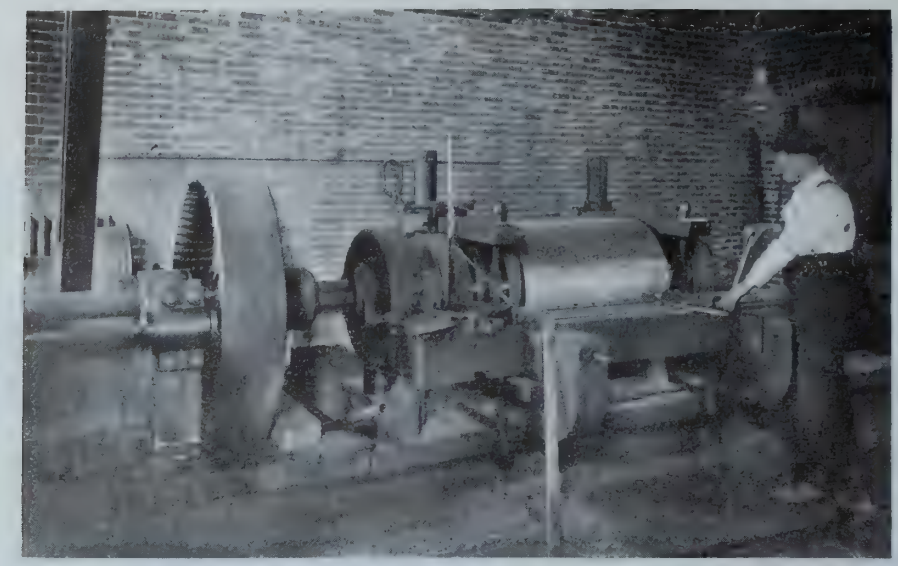
REFRIGERATION is used for drying the air blast before heating in the stoves. Undried air if blown directly into the furnaces, would carry with it water vapor equivalent to from 1 1/3 to 8 gallons per minute, according to the humidity of the air, materially cooling the smelting zone of the furnace. The process of drying air by refrigeration was originated by James Gayley, a prominent American steel maker. The air-drying plant consists of three 150-ton compound steam-driven ammonia compressors, which supply the necessary refrigeration for cooling brine which is circulated by three steam-driven, fly-wheel type, brine pumps. The furnace is tapped about every six hours, the slag being drawn off through the cinder notch four or five times during this period. When the tap hole is opened, the hot molten metal flows in a channel to the end of the cast house into large ladles mounted on trucks, by which it is quickly transferred to the open hearth furnaces to be converted into steel.

Open Hearth Steel Process

Black sheets are made of basic open hearth steel. The open hearth furnaces are always in operation except when repairs have to be made. The charging floor is at the back, and is on the same level as the furnace hearth, while the metal is drawn off on the opposite side. Two charging machines which travel along the entire length of the floor are used for feeding the furnaces with scrap steel and limestone. At the opposite side of the furnaces is the casting pit on the ground level, over which travels an electric crane for lifting the ladles and teeming the molten iron into the open hearth furnaces. This molten metal has been brought direct from the blast furnaces, thereby avoiding the necessity of charging the O. H. furnace with pig iron.

When the steel in the open hearth furnaces has been heated for a certain length of time, during which period other materials have been added to produce a steel of suitable physical properties for sheets, it is teemed into a ladle suspended from the overhead crane and poured into moulds of heavy cast iron construction, forming ingots. The filled ingot moulds are then hauled in a train of cars to the rolling mill, by which time the metal is sufficiently solidified to allow the mould to be drawn off or stripped. This is done by a 75-ton crane, which has a pair of links which grip the mould under the lugs and lift it up clear of the ingot. Another crane immediately grips the ingot and deposits it into a soaking pit, where it is maintained in an upright position at a steady temperature for about one hour.

The ingot is then lifted out of the soaking pit and deposited on an electrically operated truck and carried forward to the approach table of the blooming mill. The soaking pit furnaces are fired with producer gas and the soaking treatment is necessary to allow the ingot to attain an even temperature throughout and also to confine the pipe or segregation core to the centre. The ingot is 15 in. x 17 in. x 7 feet long.



MACHINERY ROLLS. ROLLS ARE LOWERED THROUGH THE TRAP IN ROOF OF MACHINE SHOP BY TRAVELLING CRANE DIRECTLY TO THE LATHE.

Rolling Blooms for Sheet Bars

The blooming mill is very complete in design and construction and together with its power plant is one of the best on this continent. The installation consists of a two-high 34-inch reversing, motor-driven, Morgan blooming mill. The approach table is operated by a 30-horse power d. c. motor, while the tables on either side of the mill are driven by 100 h.p. motors. The side guards for handling the bloom from one part of the rolls to the other are operated by hydraulic gear. The entire operation of the mill is controlled from a platform or pulpit located above the table affording a clear view of the rolls and the work. The blooming mill is driven by a 3,000 h.p. twin armature reversing motor of special design for this particularly severe service. The ingot is passed back and forth between massive steel rollers, which, while reducing the cross-sectional area, increases its length until, when reduced to 6 inches square, the bloom as it is now termed is about 50 feet in length. After being reduced to the desired size, which is accomplished in 15 passes, the bloom is cut into suitable lengths in a 10 x 10 inch vertical bloom shear. The blooms then pass to the bar mill to be rolled into sheet bars.

The method of rolling sheet bars is very similar to that of rolling blooms as described above. The bloom, after passing through the sheet bar mill is increased in length to 30 feet and is 8 inches wide. The sheet bars are laid on a cooling table and afterwards carried over to the sheet mill.

The Product

Steel sheets vary in thickness from No. 30 to No. 12 gauge, in length from 5 feet to 12 feet, and in width from 24 inches to 40 inches. As a general rule sheets below No. 28 gauge in thickness are rolled on a tin mill and sheets over No. 16 gauge should be rolled on a jobbing plate mill. The Steel Company of Canada is rolling sheets from No. 14 to No. 30 gauge inclusive, being the extreme range for the mill consistent with efficiency and economy.

They are "one pass cold rolled and box annealed sheets" and are being used for a variety of purposes. A considerable tonnage is being used by the galvanizers as well as in the automobile trade. The output at present is about 1,500 tons per month but could be doubled if the required amount of steel was available. War conditions prevent capacity production being attained.

The company has not as yet undertaken the manufacture of tin plate although the process follows closely for a certain number of operations that of sheets, with the main exception that sheets are always rolled from heavier bars. In both cases the order of operations is in the same sequence, viz., shearing of the bars, heating of the bars and roughing the bars, at this stage called pairs. The doubling shear of the tin mill, however, is not used in a sheet mill and from this point the operations change. Sheets for galvanizing are cold rolled, close annealed and must pass physical tests required by the most rigid specifications. In fact all sheets are made to stand certain physical tests according to the purpose for which they are required.

Sequence of Operations

The sequence of operations in manufacturing sheets is briefly as follows: Shearing the sheet bars, heating the bars, roughing the bars, reheating the sheets, doubling the sheets, reheating the pack of sheets, finish hot rolling. The next operation is to shear the pack to the required size after which the pack is opened and the sheets separated. The sheets are then cold rolled, annealed, cooled, piled in the warehouse and prepared for shipping. In some cases the sheets are annealed before being cold rolled.

Layout of Plant

The plant is laid out in such a manner that the bars and then the sheets pass from one operation to another, beginning at one end of the mill and finishing at the opposite end. The only exception to this is when the cold rolling follows the annealing. The shears come first, then the furnaces, rolls, trimming shears, while further along are the annealing furnaces, cooling floors and lastly the warehouse and the shipping room.

(Continued in next issue.)



VIEW FROM ONE END OF THE MILL SHOWING ANNEALING FURNACES, ANNEALING BOXES ON THE RIGHT AND COOLING FLOOR ON THE LEFT. MILL TRAIN DRIVE IN BACKGROUND

Halifax, N.S.—The Eastern Investment Corporation, Cragg Bldg., have the general contract and will let plumbing and electrical work for $3,000 residence for the Halifax Relief Commission, Sackville street. They also have the general contract and will let plumbing and electrical work for two $3,000, 2½ storey, frame residences for the Halifax Relief Commission, Sackville stleet. Architects, Ross & McDonald, Sackville street.

City of Brantford Plumbing By-law

Plumbing By-law Number 1450—Some New and Very Practical Clauses Not Embodied in Many Plumbing Ordinances—Each Clause of Importance Commented Upon—Charges Made for Each Inspection

THE following article should prove of very great value to many of our readers and subscribers to SANITARY ENGINEER. Particularly so when we find that this by-law is the result of thorough co-operation between all concerned in sanitary plumbing to be installed in the city of Brantford.

It will be noted that this by-law contains some clauses which mean very radical changes to the average plumbing ordinance in operation throughout the Dominion. Clauses 1 and 2 are, as will be seen, of a general nature, though clause 3 is a little out of the ordinary.

The Municipal Council of the Corporation of the City of Brantford Enacts as Follows:

Plumbing Defined

1. The plumbing contemplated under this By-law shall embrace the storm and sanitary drainage system of every house, building or lot from the street line to its terminus above the roof.

Application Permit

2. Before proceeding to construct, reconstruct or alter any portion of the drainage system or plumbing of any lot, house or building, except necessary repairs, the owner or agent shall make written application to the City Engineer's Department, giving plan of house sewer and floor plan of plumbing, and description and number of plumbing fixtures to be installed or changed.

Fee

3. In the case of new plumbing the sum of one dollar with twenty-five cents additional for each fixture shall be paid the City Treasurer on the filing of such application which fee shall cover the examination of the application and the inspection of the plumbing. In the case of old plumbing or the adding of other fixtures the only charge will be twenty-five cents for each new fixture.

It will be seen by the above that clause 3 is somewhat novel, though there are a number of towns and cities which make a charge for inspection. The general practice, however, is that the services of the plumbing inspector are gratis. We believe that to make a charge for inspection is only fair, though there is a danger of some small fellow, small in mind as well as in principle, trying to evade the law so that he may "get away" with a job; partially, too, to save the inspection fee. We are pleased to know that such would not be even tried in Brantford.

Permit

4. Blanks for such application will be furnished by the City Engineer's Department, and no work shall be commenced until such application, signed by a Licensed Plumber and the owner, shall have been approved by the Inspector of Plumbing and a permit granted. Any alteration in original application must be approved in writing by the Inspector of Plumbing. Permits issued shall not be good for more than six months.

While clause 4 may not, on the face of it, appear to be of very much importance, the wording "Signed by a licensed plumber and the owner" is of importance. It means that a plumber or sanitary engineer must be a "licensed" one and such a clause worded so very clearly and definitely is bound to give strength to the whole by-law.

Inspection

5. All plumbing shall be subject to the inspection, supervision and approval of the Inspector of Plumbing referred to hereafter as the Inspector, and of the Medical Health Officer and all faulty or defective work which may be discovered shall be made satisfactory to them. No custom plumbing shall be done except by Licensed Plumbers. But nothing herein contained shall prevent any person from installing plumbing on the house side of the trap only or from repairing on the house side of the trap only, plumbing already installed in premises of which he is owner or tenant with the consent of the owner, provided that such plumbing and repairs shall be subject to the same inspection as herein provided with respect to custom plumbing. The Inspector is to be given written notice when any work is ready for inspection, and the work must be left uncovered and convenient for examination until inspected and approved. Such inspection shall be made within sixteen working hours after the receipt of such notification and when such notification is received by ten o'clock in the morning, the inspection shall be made that day if possible. Where the conditions are of such a nature that the work cannot be left open, the inspection shall be made as soon as possible.

The reader will do well to give clause 5 much thought. It is very broad, and grants privileges to persons other than licensed plumbers or sanitary engineers, when the work to be done is on the trap side of the fixture. If a house of plumbing were to be so installed as to have all the traps installed and water and smoke tests put on the whole of the "roughing in" then any unlicensed mechanic or person capable of installing the fixtures could do so provided that these fixtures were installed to the satisfaction of the health department or plumbing inspector.

In other words, all roughing in, including all work directly connected to an open drain or sewer, in which no traps intercept the sewer air or fluid entering said sewer or drain may be installed by persons other than licensed plumbers.

There is no mention however as to who shall or shall not install a water closet, or even make repair to same, unless clause 5 means that as a w. c. bowl is the trap of that fixture all w. c.'s must be installed by a licensed plumber and no other. This would mean that if the licensed plumber were to install the roughing in the water test would require to be put on, then the w. c. followed by a smoke test, unless of course the person installing the fixtures other than the w. c. were to assume the responsibility of the w. c. standing the smoke test when the other fixtures, later installed, were being subjected to the regular smoke test.

6. The Inspector may apply either water or smoke test, and the plumber shall furnish all necessary tools, labor and assistance for such test, except that the machine for making the smoke test shall be furnished by the City Engineer's Department.

The water test shall be applied to the "roughing" in work consisting of soil pipes, waste pipes, vent pipes, and branch waste and vent pipes when practicable, on all new work in old or new buildings, except alterations or additions to work already installed, on which the smoke test may be applied. The water test shall be applied by closing all low openings on soil, waste and vent pipes, and filling the same with water to the top of the stack.

The smoke test shall be applied to all finished plumbing work and where practicable, to any alterations or additions, when a water closet is included. All other alterations or additions to be inspected but not necessarily tested. When the water test is not advisable or practicable on account of frost or other causes, the smoke test may be used.

Clause 6 is much more definite than many clauses in operation in Canada. It will be noted that the word "shall" appears in many of the sentences.

There are, however, one or two loopholes in this clause which if worded a little differently would have strengthened the by-law considerably. For example, note the words "on all new work in old or new buildings, except alterations or additions to work already installed **on which the smoke test may be applied.** The word **may** should be **shall**, so as to make the meaning quite clear. The writer recalls quite well a certain city, the plumbing by-law of which read as follows:

"The plumbing inspector, etc., may **require** either smoke or water test," etc., and while the conscientious members of the craft, both on principle, and because they knew that it was necessary that both a water and smoke test were essential, always put those tests on all their work, there were hundreds of jobs that seldom if ever had a smoke test put on them. This left a loop-hole for those less conscientious, until it was pointed out to the health authorities that the law was not quite definite enough. Then that clause was amended and made to read **"shall** require both smoke and water test."

In connection with testing the roughing-in in winter time, when there is a

danger of frost causing trouble, a compressed air test up to 10 pounds pressure would be far better than to leave the work not pressure tested at all.

Many towns and cities in Canada are adopting the compressed air test under conditions above referred to.

The word **may** in the last sentence should be "shall," as there really is no reason why a smoke test should not be put on every finished job. The word **may** leaves it to the will of the plumbing inspector on the one hand, and optional to those who install such class of work whether the smoke test is carried out.

Inspection Certificate

7. When the plumbing work has passed the proper inspection, a certificate to that effect will be given to the plumber, signed by the Inspector.

Pipes Inside and Outside Extension

8. From a point three feet outside the foundation walls of a building no materials shall be used to or within the building and connected with the sewer for the soil, waste or vent pipe, other than cast iron pipe with securely leaded joints, galvanized wrought iron pipe with screwed joints or lead pipes with wiped solder joints.

Where the foundation wall through which the soil pipe passes is three feet or less from the adjacent property boundary the soil pipe shall be extended as far as practicable to make proper connection to sewer pipe.

When the building is within three feet of the street line, the soil pipe shall be extended at least three feet from the foundation wall.

When a pipe passes through a cellar or basement it must be properly supported by brackets along the side walls, or by hooks or stirrups from the floor beams.

It will be seen that this clause deals with the question of piping that may be used in connection with the soil, waste, drain and bent pipe and that no clay tile pipe is allowed to be used within the walls of a building. It does, however, permit the use of wrought iron for waste and soil pipes, etc. This has been proved not to be the best practice. The question of using wrought iron whether black or galvanized, for soil waste and drainage has been discussed from almost every angle in SANITARY ENGINEER, and one of the largest buildings in Canada, in which "wrought pipe" was installed only comparatively a few years ago, is now having cast iron soil and waste pipes installed and the wrought iron pipe taken out.

SANITARY ENGINEER believes in adopting the safer course, and when science and natural law declare against the use of certain material for such purposes as those named, there is no reason why risks should be taken.

Iron Pipe to be Used

9. When the diameter of any pipe is greater than two inches it shall be of iron, excepting short connections to such fixtures as closets, slop sinks and urinals, when lead may be used.

Weight of Cast Iron Pipe

10. No cast iron pipe shall weigh less than the following:

Diameter of Pipe.	Weight per lineal foot.
2 inch	4 lbs.
3 inch	6 lbs.
4 inch	9 lbs.
5 inch	13 lbs.
6 inch	15 lbs.

except beneath basement floors and underground, when pipe of the following weights will be used:

Diameter of Pipe.	Weight per lineal foot.
2 inch	5½ lbs.
3 inch	9½ lbs.
4 inch	13 lbs.
5 inch	17 lbs.
6 inch	20 lbs.
8 inch	33½ lbs.

Weight of Wrought Iron Pipe

11. Wrought iron pipe shall be of standard weight.

Weight of Lead Pipe

12. No lead pipe shall weigh less than the following:

Diameter of Pipe.	Weight per lineal foot.
1¼ inch	2 1-3 lbs.
1½ inch	2 2-3 lbs.
2 inch	3½ lbs.
3 inch	6 lbs.
4 inch	8 lbs.

Fittings

13. All fittings shall correspond in weight and quality. Fittings on wrought iron wastes to be recessed drainage fittings. When soil, waste or vent pipes are increased or diminished in size, proper fittings shall be used.

Clauses 9, 10, 11, 12 and 13 are all of a general nature, and quite in accord with most plumbing by-laws. There are, however, one or two features in clause 14 that are not embodied in most Canadian plumbing by-laws.

Connections Ferrules

14. All connections between lead and wrought iron pipes to be made with brass solder nipples. Every connection with brass thimbles or ferrules having properly wiped joints and the ferrules properly gasketed, leaded and caulked into the pipe. Ferrules for 4 inch pipe shall not weigh less than 2½ lbs.; for 3 inch pipe—1¾ lbs.; for 2 inch pipe—1½ lbs. Each ferrule not to be less than 4 inches in length. No waste pipe shall be branched into the lead bend or the lead connection of a water closet or slop sink.

Size of Soil Pipe

15. The main soil pipe from the sewer connection to the top shall be not less than four inches in internal diameter at every point. In a finished residence when it is desired to install a bathroom outfit consisting of not more than three fixtures over a finished room, and it is found to be practically impossible to use a four inch soil pipe, a three inch soil pipe may be used subject to the approval of the Inspector.

It will be noted that clause 14 forbids wiping any waste pipe into the w. c. lead bend, a practice becoming less favorable every day, making almost every fixture waste pipe independent of each other, and much more desirable. Referring to clause 15, SANITARY ENGINEER, however, is of the opinion that a four-inch main soil and waste pipe is the smallest that should be allowed. There is so little to be gained by using three-inch pipe that it is, we believe, the safer course to use the larger size, 4 inches. Of course this clause only permits the use of three-inch where "it is found to be practically impossible to use a four-inch. So it may almost be taken for granted that four-inch pipe will be more used than three-inch pipe.

Soil Pipe Obstructions

16. No trap or other obstruction to the free flow of air through the whole course of the house sewer and soil pipe shall be placed on these pipes.

Though this clause is one of the shortest in the whole by-law, it is one of the most important of them all. It proves that those who were responsible for the work of compiling this plumbing by-law must have given the main house problem a great deal of thought. From inquiries made when interviewing members of the plumbing trade in Brantford, it transpired that very few could be found whose practical experience would lead them to be in favor of the use of the main house trap, thus accounting for the fact that clause 16 forbids the use of the main house trap.

Soil Pipe Above Roof

17. Every soil pipe must be extended at least two feet above the roof of the building and above the top of any window within a distance of fifteen feet. The end of the soil pipe shall be left open. Roof flashings shall be made with not less than 4 lbs. sheet lead or less than 16 ounce copper.

This clause deals with the roof terminal, and we regret to see that a very old and almost obsolete method is being adhered to, not by any means in keeping with this new by-law in general.

A number of years ago, SANITARY ENGINEER published some very valuable information regarding soil pipe roof terminals, and the results of research work carried on in Winnipeg and a number of cities in the North-west. The evidence procured proved that the shorter a pipe terminal could be made the better. In fact, a special roof terminal fitting was adopted in the north. But with the present design of roof flashings that can be procured, which will fit any pitch of roof, and also which dispense with a hub, there is no practical purpose being served by demanding that a roof terminal shall be 2 feet long.

Regarding that portion of the clause which requires a pipe to be carried above any window when said window is within 15 feet if the pipe terminal, we are of the opinion that such a terminal should be run in a horizontal position to a point that would allow it to be run through the roof near to and above the window as shown in Fig. I. In fact if all terminals were made to project through the roof near the peak or ridge, there would be fewer blocked up with hoar frost than is the case in most parts of Canada where the temperature drops below zero and cold winds are often experienced.

(Continued in next issue.)

Ottawa, Ont.—F. J. Tapp, 36 Armstrong, has the plumbing work for $4,500 residence for Wm. O'Byrnes, 239 Arlington avenue.

SANITARY ENGINEER

PUBLISHED ON THE FIRST AND FIFTEENTH OF EACH MONTH.

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VOL. XII. AUGUST 15, 1918 No. 16

THIS BIGGER BUSINESS BUILDING CAMPAIGN

TO warrant the success of this bigger business building campaign there is required to be an earnest conviction in the minds of every member of the trade that, first, there is a shortage of houses in almost every town and city in the Dominion. Second, that the plumbing and heating systems in thousands of buildings are in bad condition and need repairs being done to them. Third, that the farmer whose home is not fitted up with every city Convenience cannot possibly be as great an asset or earning power to his country as if those conveniences were installed in his home.

Now, we all know that there is a shortage of houses, therefore, very little room for argument to the contrary exists. Plumbing and heating systems when not in first class order are a liability and a menace to the health of the users. Repairing same will turn these systems into an asset. And the farmer once convinced that it is possible for him to be as comfortable in every respect all the year round as his city cousins will not be slow to invest his money in sanitary and heating appliances.

REQUIRES SALESMANSHIP

How can this business be acquired from those who need the labor and material which we in the sanitary and heating engineering trade have for sale? Simply a case of salesmanship and every man who reads SANITARY ENGINEER from cover to cover will be a far better salesman as a result. The sanitary and heating engineer knows the practical side of his work. He knows the materials he uses and all that, but lacks salesmanship.

There are a number of methods that can be adopted. In the first place, if the sanitary and heating engineer has a store and the store window is used to display his goods he will be taking the first step towards being a merchant, and after all everybody likes to see the things they are going to buy. The store window should be used, kept clean and tidy, and have the price attached to every fixture.

Then there is the personal canvass. Surely there are lots of persons whom you know are the owners of a poor bathroom outfit or a poor heating system. Get right after these people and show them what it is likely to cost them if repairs are not done. Just to cite one case last winter. The writer met a gentleman on the street car and having seen his face before somewhere made himself known. The gentleman said: "Well, well! You're the very person I want to speak to. The fire in my furnace will not stand checking down. I must have the drafts full on or I cannot keep the fire burning at all. What would you advise me to do?" The writer, of course, advised that he take a look at the chimney and see that it was clean, did not leak above the roof, etc. "Leak above the roof? How could a chimney leak above the roof or leak at all?" exclaimed the man. In reply he was told that if there were cracks and crevices in the brick work above the roof or even below the roof that the chimney would not "pull" well.

The very next day the gentleman again met the writer and told him that the chimney did leak and what was more it was a single brick chimney built with one full side and two halves exposed. The chimney was rebuilt, the whole heating system overhauled and three tons less coal burned during the winter just passed than the winter of 1916-17.

HOW THE MANUFACTURERS' AND JOBBERS' SALESMEN CAN HELP

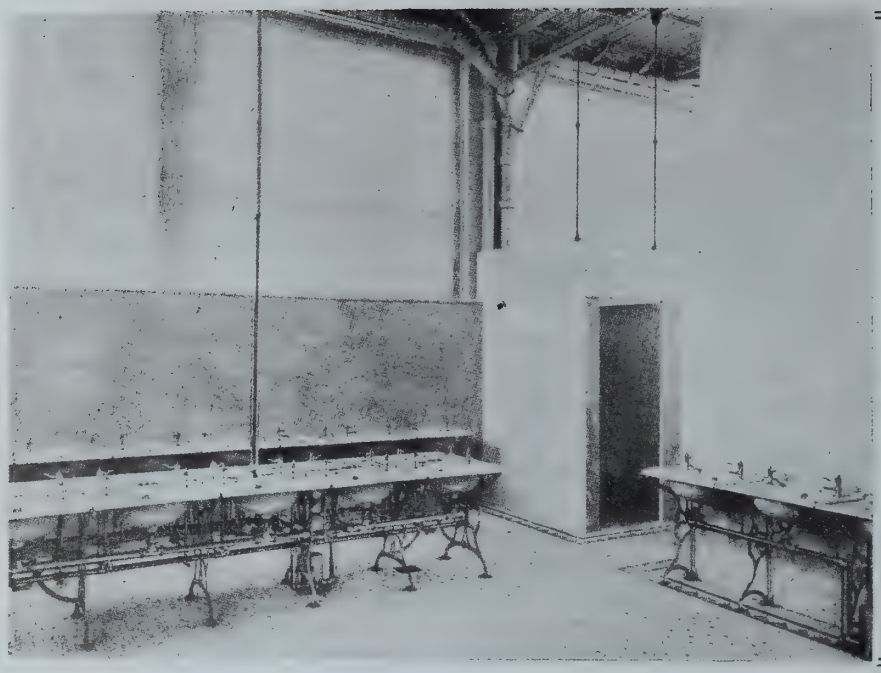
After all, the actual work will rest upon the effort of the individual salesman. He must play his part in a big way.

Take hold of this campaign not as a little selling scheme but as a patriotic national crusade. Do your best to make every sanitary and heating engineer see it on this high plane, and line up every one of them.

Go out to make a thorough job of it and cover your territory. See your friends. Call on your customers. Get after every stranger you can reach. This is a campaign to the homes of farmers and every home must be better equipped with city conveniences.

Do your part in harmonizing local interests and keeping the campaign moving freely. Be a little self-appointed walking delegate to bring about a closer co-operation among the members of the trade in your territory.

(Continued on page 22.)



FACTORY SANITATION

Sanitary conveniences in a factory or workshop are becoming a very important factor of efficiency.

By "Thomas Stansfield"
Sanitary Engineer

Wash Room of a Large Manufacturing Plant
The battery of lavatories shown here takes up very little room, is highly sanitary and commodious. An asset to any business and is without doubt appreciated by the workmen.

TIME, no matter how it is used, is the most valuable asset of mankind. We very often have heard it remarked that time and material costs more than ever in the history of the world. But I venture to say that time was never so wasted as it is to-day, when we take into consideration the amount of labor-saving appliances that are not taken advantage of.

Take for example the average factory and the poor toilet and wash room accommodation provided, and try to consider the amount of time wasted by workmen in such poorly equipped factory as against a well-fitted-up plant.

Labor is a very important part of every manufacturing business and more so when the machinery operated by the workmen is costly and must turn out high-priced articles at a rapid rate.

A minute here, a minute there, when wasted, no matter how, will very soon eat a big hole in the profits, and to make most concerns pay dividends on almost all investments made in industrial plants requires the application of scientific management. The efficiency and capacity of the working unit are now being considered more than ever in the history of the world.

Well equipped plants have high speed tools; molding machines, pneumatic chucks; the very best transmission and specially designed machines for special purposes. Factory superintendents are gifted with more advanced thought. They are beginning to realize that the workman is just as important as the finest equipment, and everything which will keep him in first-class working condition must be provided.

A skilled workman differs in no way from an athlete and, like an athlete, to be his best and do the very best work must have a clean body, clear eye, sharp mentality, steady hand, and must also have a reserve of muscular and nervous energy. No workmen can be in such a condition if they are not procuring good wholesome food that nourishes the body. And such food can only give off its natural food values when clean workrooms are provided, well lighted and free from foul air.

EDITOR'S NOTE

This series of articles is being published with a view of showing members of the trade how much more efficient labor can be made if sanitary appliances are provided for workmen. The articles are taken from actual experience and can be used as selling talks.

The average factory or workshop is a good prospect for every sanitary engineer. He should cultivate new, bigger and better business among the factory owners by showing how much more efficient workmen will be if adequate toilet and washroom accommodation is provided.

We are indebted to the Standard Sanitary Manufacturing Co., Pittsburgh, for the accompanying illustrations.

Working in dark poorly lighted shops and cold rooms will soon wreck the finest workmen, both physically and mentally. Sound, economic principles dictate that all necessities be supplied, not for reasons of philanthropy, but to keep the labor equipment up to the highest standard.

Sanitary Equipment Saves Times

The need for sanitary equipment in our factories and workshops, does not by any means rest upon the value of sanitation for hygienic reasons, but is made imperative because of the fact that cold cash can be saved, production can be increased, therefore cheapened; general maintainence charges can be materially reduced, and efficiency increased by the proper number and distribution of sanitary appliances.

Take for example a factory in which say 500 men are employed, each man loses three minutes a day walking an unnecessary distance to the water closet or urinal, or waiting in line at the toilet convenience for their turns, it would mean a loss each day of over three working days for one man. Allowing an average wage of $3.00 per day, and 300 working days in a year, then the loss from this cause alone would amount to $2,700 annually, or an amount equal to an investment at 5 per cent. of $54,000.

As a matter of fact, however, the extra equipment to give all the w.c., lavatory and urinal accommodation for a plant employing such a number of men referred to would cost but a fraction of the $54,000, perhaps not as much as would be saved in one year alone. Those figures give some real food for thought.

Wash Room and Lockers

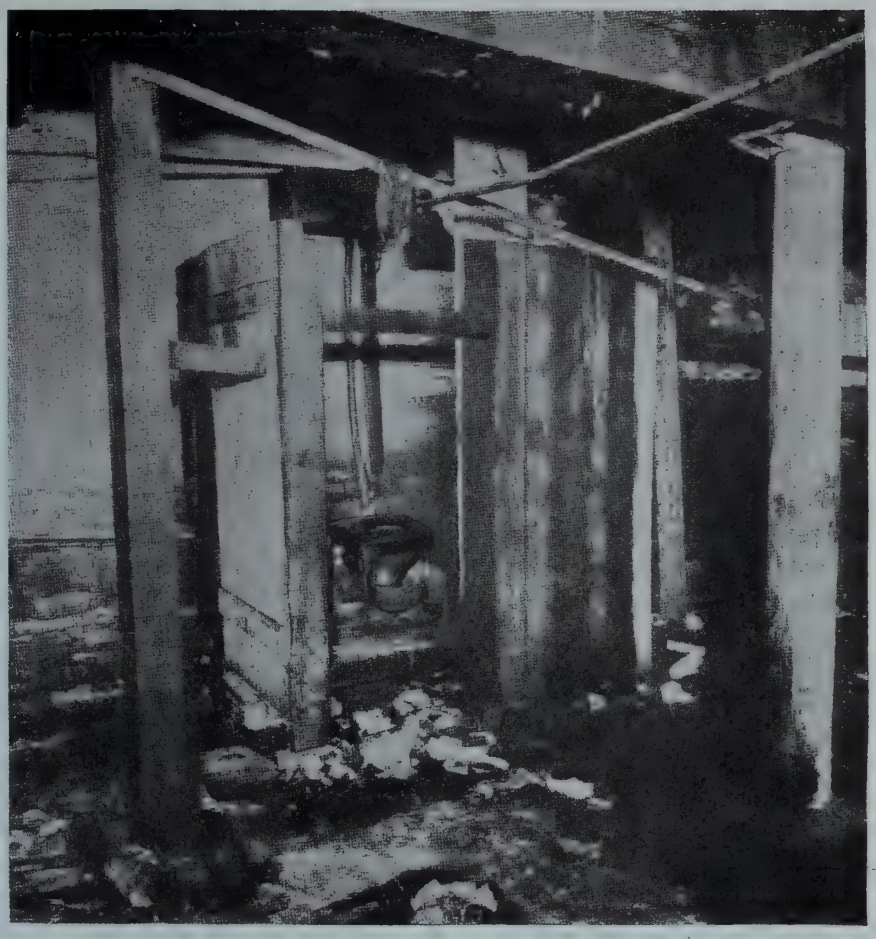
When an athlete finishes his daily exercises, or after competing in an athletic event, about the first thing he does is to take a shower and have a good rub down. He finds it is necessary if he expects to keep well; and what is proved to be absolutely necessary to keep an athlete in first-class "fettle" is surely required even to a greater extent in a workman and more so because of the fact that an athlete is only engaged in an event, or an exercise for a short period, while the average workman is employed a full eight hours or more. If sanitary con-

veniences are provided, such as a shower, for example, that workman can partake of a shower bath, a good rub down and a change of clothes, and he becomes at once a better man physically, yea and mentally too. His step becomes more elastic, his eyes are brighter, he feels better, he is better all through. And there is far less liability of such a man losing time or tiring of his work, because he actually is being kept "fit."

There is another reason why wash rooms should be provided. Every human being takes more or less commendable pride in looking well, feeling well, and being well dressed and cleaned. Therefore we should add to the lavatories and showers, ranges of lockers, water closets, urinals and all other sanitary fixtures, according to the nature of the industry.

Cleanliness is without doubt next to godliness, for within reasonable limits, the better dressed and cleaner an employee is, the greater asset he is to the industry that employs him. The factory then which is equipped with modern sanitary conveniences cannot fail to attract and hold the very best workmen. There is not a workman living who would not prefer to be employed in a place where he can go to work in a neat, clean suit of clothes, change them when he gets there and don a working suit, which has been drying and airing during that period when not in use. Then when his day's work ends he can enjoy a shower bath, a wash, don his street attire and step off home, feeling like a new man, than on the other hand work in a dingy, dirty smoky place, where there are no bathing or washing conveniences, and he must go back home from work in the dirty work clothes he has worn all day.

On right is shown a specimen of what is furnished by hundreds of Canadian employers of labor. These hovels are sometimes cleaned up especially when the factory inspector is liable to drop in. Inspections should be unexpected, because generally the foreman gets the place "slicked up" a bit when they get to know that an inspection is likely to be made. Take this "toilet" accommodation for example. Would any self-respecting person work any longer in a place than an unkind fate made him or her where such filthy conditions prevailed? No person could possibly respect an employer who provided no better accommodation.



Factory inspectors should be sanitary inspectors, too. No self-respecting workman would prefer such accommodation in spite of monetary gains, as against such a well-equipped wash-room shown at the top of this page.



Toilet facilities as bad morally as from a sanitary standpoint

Indifferent help is the worst liability a business can have, for if men are indifferent, their work will be the same. Pride in management and product and the employment of the pick of men is what lifts a business out of the keen competitive into the quality class.

Get Men Interested in Their Work

Washing and bathing accommodation will bring men to work ahead of time so they can change their clothes; the very act of bathing and washing in company with other men, throws them together and they become better acquainted; makes a sort of social club of the factory outside of working hours, and promotes a good fellow feeling all round.

The very act of taking off one's "walking clothes," and donning work clothes is like the athlete getting into his gymnasium toggery. His movements are freer and easier, and his efficiency becomes increased by so doing.

No matter how we view the situation there is only one logical conclusion. The wash room, showers and lockers are an asset to any business and the choice of the proper type of fixtures and location of same need now only to be considered.

For economic reasons, the wash room, showers and lockers may be grouped in one part of the building, so that time will

Continued on page 27.

THIS BIGGER BUSINESS BUILDING CAMPAIGN

(Continued from page 19)

Be on the outlook for new ideas that can be used in window displays and in advertising and pass them around.

Remember that the work is going to be done by fitting out just one home at a time, by selling one plumbing and heating appliance after another and that it is the individual sale that counts. Go after every sale to win, as if that sale was essential to the true success of the campaign.

WHAT THE MANUFACTURER AND JOBBER CAN DO

The success of this campaign will rest in a great measure on the manufacturer and jobber, on how well they plan and co-operate with each other.

Get behind this movement by lining up your agents and your salesmen everywhere to boost for it and work for it. Sell them the idea so that they will inspire every sanitary engineer they call on.

Focus your advertising as far as you can on this bigger business building idea, in order to sustain the interest of everybody and point out how each piece of goods you manufacture will assist.

Offer prizes to your salesmen for the men who make the best records in co-operating with this campaign and contributing to it.

Send out letters to your salesmen along with a selected list of customers, to keep them in close touch with what you are doing in the campaign.

Every manufacturer and jobber should insist upon each one of his travellers being regular readers of SANITARY ENGINEER. The pick of the whole plumbing and heating trade are readers of the paper. One traveller told us a few weeks ago that he read SANITARY ENGINEER from cover to cover and always was able to find some item that would interest a customer. Very often the chat about an article resulted in a sale.

Every traveller should play the part of friendly stimulation and work for harmony among the different local sanitary and heating engineers. Carry the good ideas from one town to the next. Lend a hand where it is needed. In short, the traveling salesman must be a strong, hard-working bond between his employer and his customer.

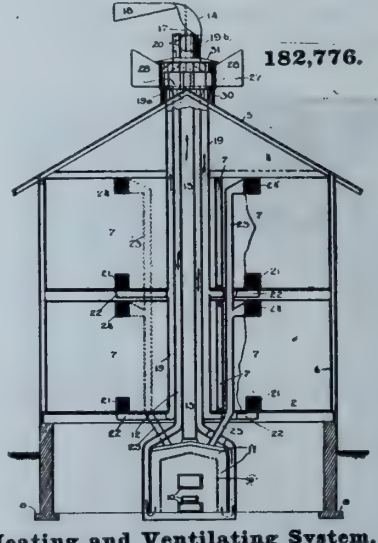
New Canadian Patents

No. 182,776.

Gustaf H. Akerlund, Wylie, Minnesota, U.S.A., 12th March, 1918; 6 years. Filed 20th December, 1917. Receipt No. 288,897.

Claim.—1. In a house heating and ventilating system, the combination with a fire apparatus, of a smoke stack therefrom up through the building and its roof, a fresh air tube spaced about the smoke stack and extending to a point between the roof and the top of the smoke stack, a foul air tube spaced about the fresh air tube and having its upper part reduced in diameter above the top of the fresh air tube, and below said reduction formed into outwardly arched tubular branches between which the fresh air is to pass into the top of the fresh air tube.

2. In a house heating and ventilating system, the combination with a fire apparatus, of a smoke stack therefrom up through the building and its roof, a fresh air tube spaced about the smoke stack and extending to a point between the roof and the top of the smoke stack, a foul air tube spaced about the fresh air tube and having its upper part reduced in diameter above the top of the fresh air tube, and below said reduction formed into outwardly arched tubular branches between which the fresh air is to pass into the top of the fresh air tube, a rotary hood mounted on top of the smoke stack and the foul air tube, and means for the wind to act on and turn said hood with its closed side to the



Heating and Ventilating System.

wind, and a rotary wind chamber about the part of the foul air tube having spaces for the wind to enter the fresh air tube, said wind chamber having a front opening for the wind to enter, and means for the wind to act on and hold the chamber with the opening against the wind, said means consisting of two lateral rearwardly diverging vanes one fixed at each side of the wind chamber.

No. 182,702.

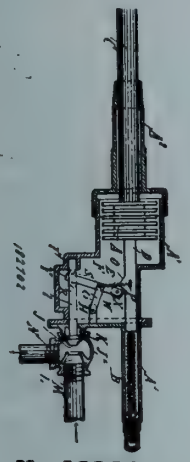
Gerhardt F. Schwartz, St. Louis, Missouri, U.S.A., 5th March, 1918; 6 years. Filed 22nd December, 1917. Receipt No. 288,967.

Claim.—1. A thermostatic valve comprising a thermostatic member, a valve, a valve stem, a tilting lever engaging said valve stem, a pivoted standard pivotally supporting said tilting lever, the pivot point of said lever being movable, a trip member adapted to be actuated by said thermostatic member, said trip member engaging one end of said tilting lever, the other end of said tilting lever engaging and adapted to actuate said valve stem.

2. A thermostatic valve comprising a thermostatic member, a valve stem, a tilting lever engaging said valve stem, a pivoted standard pivotally supporting said tilting lever, the pivot point of said lever being movable, a trip member adapted to be reciprocated by said thermostatic member, a roller carried at one end of said tilting lever and engaging said trip, spring means adapted to main-

tain said roller in engagement with said trip, the other end of said tilting lever engaging and adapted to actuate said valve stem.

3. A thermostatic valve comprising a thermostatic member, a valve stem, a tilting lever engaging said valve stem, said valve stem being provided with a slot having upper and lower knife edges, a pivoted standard pivotally supporting said tilting lever, the pivot point of said lever being movable, a trip member



No. 182,702.
Thermostatic Valve.

adapted to be actuated by said thermostatic member, said trip member engaging the end of said tilting lever, the other end of said tilting lever engaging said slot of the valve stem and adapted to actuate the valve stem.

4. A thermostatic valve comprising a thermostatic member, a valve stem, a tilting lever engaging said valve stem, a pivoted standard pivotally supporting said tilting lever, the pivot point of said lever being movable, a trip member carried directly by said thermostat member, said trip member engaging one end of said tilting lever, the other end of said tilting lever engaging and adapted to actuate said valve stem.

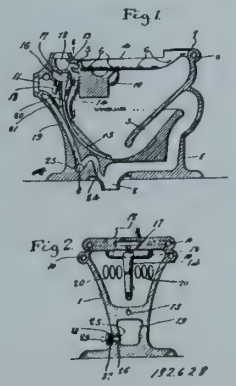
No. 182,628.

Andrew F. Barron, Watervliet, New York, U.S.A., 5th March, 1918; 6 years. Filed 14th November, 1917. Receipt No. 287,616.

Claim.—1. In a closet bowl structure, the bowl body having an ordinary outlet trap structure, said bowl being provided with an overflow passage separated from the receiving receptacle of the bowl, said bowl further provided with openings communicating with the reeciving receptacle of the bowl and with said overflow passage, a tube for guiding a part of the flushing water of the bowl into said overflow passage, and a shield for preventing the sealing flow of water from passing through said tubes into said overflow passage.

2. In a closet bowl structure, the bowl body having an ordinary outlet trap structure, said bowl being provided with an overflow passage separated from the receiving receptacle of the bowl, said bowl further provided with openings communicating with the receiving receptacle of the bowl and with said overflow passage, a tube for guiding a part of the flushing water of the bowl into said overflow passage, and a shield for preventing the sealing flow of water from passing through said tubes into said overflow passage, a trap formed in the lower portion of said overflow passage and communicating with the outlet of the bowl.

3. In a closet bowl structure, a closet bowl having a seat section, said closet bowl being provided with a water inlet opening, a trap structure in said bowl, arcuate tubes carried by the rear portion of said bowl and having its lower end resting upon the upper surface of the bottom of the recess formed within the bowl, a relatively short distance outwardly from the mouth of said trap structure for ejecting a stream of water over the bottom of the recess of the bowl and into the mouth of the trap, a second tube extending downwardly within said bowl along the rear wall of the recess thereof, and having its discharge end positioned for conveying a stream of water for discharge along the rear wall of the recess of the bowl, said second tube having its discharge end positioned below the normal water line of the bowl being provided with openings communicating with the recess of the bowl and



182,628. Closet Bowl.

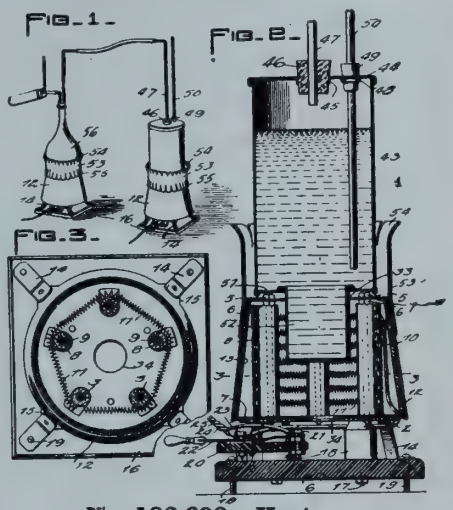
with said overflow passage, a third tube carried by said bowl and provided for conveying a part of the flushing water of the bowl into said overflow passage.

4. In a closet bowl structure, a closet bowl having a seat section, said closet biwl being provided with a water inlet opening, a trap structure in said bowl, arcuate tubes carried by the rear portion of said bowl and having its lower end resting upon the upper surface of the bottom of the recess formed within the bowl a relatively short distance outwardly from the mouth of said trap structure for ejecting a stream of water over the bottom of the recess of the bowl and into the mouth o fthe trap, a second tube extending downwardly within said bowl along the rear wall of the recess thereof.

No. 182,699.

Harry Erwin Redecker, Rupert, Idaho, U.S.A., 5th March, 1918; 6 pears. Filed 23rd October, 1917. Receipt No. 286,-726.

Claim.—1. A heater comprising a frusto-conical casing arranged with its large end downward and provided with a lining of non-heat conducting material on its side wall and base, and having axial openings in its top and base for the passage of air, a series of insulating supports arranged in annular form near the side wall, a heating coil supported by the supports, a switch below the base for controlling the flow of current to the



No. 182,699. Heater.

coil, a sleeve having one end shaped to fit around the upper end of the heater and having outwardly bent lugs at its upper end, and an attachment for use with the heater and adapted to seat upon the top thereof within the sleeve,

3. A heater comprising a frusto-conical casing arranged with its large end downward and having avial openings in its top and base for the passage of air, a series of insulating supports arranged in annular form near the side wall, a heating coil supported by the supports, and a switch below the base for controllinfi the flow of current to the coil.

4. A heater comprising a frusto-conical casing arranged with its small end upward and having axial openings in its top and bottom, a heating element within the casing, means for controlling the flow of current to the element, a sleeve for supporting articles to be heated fitting around the top of the casing and extending above the same and having means for supporting the articles to be heated.

Ottawa, Ont.—J. Germain, 50 Leonard avenue, has the plumbing work for $5,000 residence for B. A. Grison, 21 Fentiman avenue.

Merritton, Ont.—Loraza & Lebio, and McLaughlin Bros. have the general contract for sewers costing $12,000, for the Municipal Council.

Market Conditions and Tendencies

Statements Regarding the Prices and Trend of Supplies.

THE MARKETS AT A GLANCE

INTEREST in the markets centres very largely around galvanized sheets which have recorded an advance of 50c per 100 pounds since last issue. Reports are to the effect that galvanized sheets are becoming particularly scarce while stocks of black are also diminishing rapidly. Jobbers indicate that practically all sheets now being sold are going to manufacturers engaged in war work. Only by showing this distribution will replacement of stocks be possible, it is said. However, it might be pointed out that jobbers have served a very useful purpose in looking after the demands imposed by war industries, many of whom would have had to close down temporarily had not supplies been available from jobbers stocks.

Metal markets show little change in the half month period. Tin continues scarce, practically all coming to hand being sold to arrive and little spot offering. Lead continues very firm, while spelter shows weakness; antimony has declined somewhat.

The continued high price of tin and strength of the lead market have resulted in a 5c advance being made in the prices of solder prevailing in some quarters. Manufactured lead products show no change though higher levels would not come as any great surprise in view of the firm tone held on pig lead.

A shipment of boiler tubes containing some of the smaller sizes is in transit and will afford a measure of relief to the trade. The market now is quite bare of supplies. Manufacturers of wrought iron pipe and soil pipe report no lessening of the difficulties they are encountering getting supplies. Production is being affected and the demand is hard to satisfy. Business as a whole shows improvement.

TORONTO, Aug. 12.—The most important, in fact about the only real price change to be recorded for the half month period is an advance in galvanized sheets of 50c per 100 pounds with the tendencies pointing towards a revision of quotations on black. The metal markets are comparatively quiet, tin maintaining a high basis of quotations, lead holding up and spelter showing signs of weakness. An improvement in movement of goods is noticeable, though some lines are harder to get.

Range Boilers Hold Firm and Unchanged

RANGE BOILERS.—The market remains very firm though unchanged, an advance in galvanized sheets since last issue strengthening the undertone materially, while the growing scarcity of these is an added factor. Sales are being made in very fair volume at the following prices:

	Standard	Extra Heavy
30-gallon range boilers	$14.00	$17.00
35-gallon	17.00	20.50
40-gallon	20.50	24.00
52-gallon	28.00	32.00
66-gallon	37.00	42.00
82-gallon	45.00	50.00
100-gallon	62.00	70.00

Nothing to be Added to Enamelware Reports

ENAMELWARE.—Manufacturers intimate there is nothing to be added to the reports already given out as regards conditions. A greater interest in this line is now manifest—the completion of building in course of construction, having a tendency to stimulate trade somewhat. Prices are unchanged.

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Sinks, roll rim, 18 x 30 in., staple	16 80
Closets, oak tank and seat	24 00
Do., enamel iron or white vitro tank	26 00

Operations Greatly Restricted; Prices Hold Firm

SOIL PIPE, FITINGS.—Operations of manufacturers of soil pipe are beng greatly restricted owing to difficulty in procuring pig iron. The outlook for the future is serious and as the visible output is oversold, orders are not being accepted until the opportunity presents itself for completing same. No change in discounts shown below has been made.

SOIL PIPE FITTINGS.

Medium and extra heavy soil pipe, 6-inch and under	30%
8-inch soil pipe	25%
Medium and extra heavy fittings, and under	40-40 & 2½%

C. I. PIPE FITTINGS.

Cast iron fittings	Net List
Plugs	15%
Bushings	18%
Flange unions, standard	Net List
Dart unions, ¼-inch to 2-inch	15%
Do., 2½ in. and larger	6½%
Nipples, up to 4-inch	45%
Do., 4½-inch and larger	40%
Do., running thread 4-in. and under	25%
Couplings, 4-in. and under	35%
Do., 4½ in. and larger	15%

MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittgs., Class A, lb.	.60	.75
Do., Class B., lb. net	.27	.37
Do., Class C., lb. net	.19	.27

Waste Very Firm; Oakum Unchanged

WASTE OAKUM.—A firming element has entered into the situation in respect to waste. Cotton rags show a substantial advance and whereas this will not affect waste contracted for the balance of the year, it will have a bearing on next year's figures and probably on the man on the street who buys only on the market from day to day.

Oakum has held steady with a very fair volume of business reported as transpiring. Prices are unchanged.

	Per 100 lbs.
Best American	$21 50
Clipper, spun	21 00
Do., unspun	19 50
Plumbers', spun	10 00 — 11 00

Valves Unchanged; Fair Demand Apparent

VALVES.—A fair amount of business is passing and quotations hold unchanged at discounts recently named. The market is firm though no immediate advance is looked for. Discounts ruling follow:

	Discount off list
Ground work	42
Compression work, standard	47
High grade	41
Cushion work	40
Fuller work, standard	45
High grade	38

Basin cocks, No. 0 standard	40
Nos. 1 and 2	40
Bath cocks	50
Flatway stop and waste cock, standard	50
High grade	47
Roundway stop and waste cocks, standard	50
High grade	47
Brass steam cocks, standard add 10%.	
Globe, angle and check valves, standard.	Net
Do., removable seat	Add 5%
Radiator valves, standard	10
Do., removable seat	Net List
Patent quick opening valves	30
Basin Cocks—	
No. 0 and 1, Fuller pattern	45
Globe, angle and check valves, standard, medium pressure	20
Radiator valves, standard med. pressure.	30
Radiator valves, removable seat, medium pressure	25

Wrought Iron Pipe; Supplies Grow Lighter

WROUGHT IRON PIPE.—The increasing difficulty being experienced in getting materials through is resulting in a curtailed production of pipe. With a fairly good demand in evidence, manufacturers are experiencing some difficulty in keeping ahead of the orders. Prices hold at levels shown in panel herewith:

NEW SCHEDULE OF PRICES ON WROUGHT IRON PIPE

Price List No. 36 (July 5, 1918)

	Black	Galvanized
	Per 100 feet	
Standard Buttweld		
⅛ in.	$ 6 00	$ 8 00
¼ in.	5 22	7 35
⅜ in.	5 22	7 35
½ in.	6 63	8 20
¾ in.	8 40	10 52
1 in.	12 41	15 56
1¼ in.	16 79	21 05
1½ in.	20 08	25 16
2 in.	27 01	33 86
2½ in.	43 29	54 11
3 in.	56 61	70 76
3½ in.	71 76	88 78
4 in.	85 02	105 19
Standard Lapweld		
2 in.	29 97	36 45
2½ in.	45 05	55 28
3 in.	58 91	72 29
3½ in.	73 60	91 54
4 in.	87 20	108 45
4½ in.	99 06	123 82
5 in.	115 40	144 30
6 in.	149 80	187 20
7 in.	195 20	243 95
8 L in.	205 00	256 25
8 in.	236 20	295 20
9 in.	282 90	353 25
10 L in.	262 40	328 00
10 in.	337 80	422 30

Terms 2% 30 days, approved credit.
Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Some Tubes Coming; Will Afford Relief

BOILER TUBES.—The news that some small sizes of boiler tubes are on the way will be welcomed by the trade generally. It is some time since any arrived and the market is pretty bare of supplies just now. Prices show no change in quotations herewith:

Toronto—	Per 100 feet Cold drawn	Lapweld
1 inch	$36 00	$ ....
1¼ inch	40 00	....
1½ inch	43 00	36 00
1¾ inch	43 00	36 00
2 inch	50 00	36 00
2¼ inch	53 00	38 50
2½ inch	55 00	42 00
3 inch	64 00	50 00
3¼ inch	....	58 00
3½ inch	77 00	60 00
4 inch	90 00	75 00

Sheets Make 50c Advance; Growing Scarce

SHEETS, PLATES.—An advance of 50c has been recorded in galvanized sheets in some quarters during the week. Black sheets have held firm and unchanged though the undertone is very strong and a change to higher levels woul dnot come as any great surprise. Stocks of both black and galvanized are becoming pretty well depleted and shipments on the way are by no means equal to heavy demands being made on supplies. The situation in galvanized sheets is reported particularly bad in some quarters. Quotations ruling to-day follow:

BLACK SHEETS—		Per 100 lbs.	
10 gauge	$....	$10 00	$12 00
12 gauge	....	10 10	10 00
14 gauge	7 45	7 90	8 40
16 gauge	7 50	8 00	8 50
18-20 gauge	7 80	7 55	8 05
22-24 gauge	7 85	7 60	8 10
26 gauge	7 90	7 65	8 15
28 gauge	8 00	7 75	8 25
3-16,inch plate	....	10 10	10 25
¼-inch boiler plate	....	....	10 00
GALVANIZED SHEETS—			
10¾ oz.	$9 50	$9 75	$10 00 $10 25
U.S. 28	9 20	9 45	9 70 9 95
U.S. 26	8 90	9 45	9 40 9 65
22 and 24	8 75	9 00	9 25 9 50
18 and 20	8 60	8 85	9 10 9 35
16	8 45	8 70	8 95 9 20
14	8 35	8 60	8 85 9 10

Solder Goes Up 5c; Lead Products Steady

LEAD AND ZINC PRODUCTS.—five cent. per pound advance in solder is reported in some sources. The continued high price of tin and scarcity of supplies along with continued firmness in the lead market are contributing factors. Prices on guaranteed now range from 60 to 65; strictly 55½ to 68½c; commercial, 51c to 57c; wiping, 55 to 60c; wire, 70 to 85c per pound.

Manufactured lead products are unchanged though higher levels would not come as any great surprise to some in the trade owing to the firm tone noticeable in the pig lead market. Quotations prevailing follow:

Lead pipe, lb.	$0 15	$....
Lead waste pipe, lb.	0 16	....
Lead traps and bends	Net list.	
Lead wool, lb.	0 15½	0 16
Lead sheets, 3 to 3½ lbs. sq. ft., lb.		0 13¼
Lead sheets, 4 to 8 lbs., sq. ft.	0 12½	0 13
Cut sheets, ¾c lb. extra, and cut sheets to size, 1c. lb. extra.		
Solder, guaranteed, lb.	0 60	0 65
Solder, strictly, lb.	0 55½	0 68½
Solder, commercial, lb.	0 51	0 57
Solder, wiping, lb.	0 55	0 60
Solder, wire, lb.	0 70	0 85
Zinc sheets	....	0 26

Old Materials are Unchanged; Quiet Season

OLD MATERIALS.—The metal market is comparatively quiet, a seasonable condition, and no news of particular interest has developed during the past couple of weeks. Prices are unchanged and held at following levels:

Tea lead	$0 05¼	$....
Heavy lead pipe	0 07½	0 07¾
Yellow brass	0 12	0 13
Red brass	....	0 21
Light brass	....	0 09½
Heavy zinc	0 05½	0 06
Heavy copper	0 21½	0 22
Stove plate, per ton	17 00	18 00
Old cast iron, per ton	25 00	26 00

Tin Supplies No Better; Lead Holds Firmly

INGOT METALS.—Indications are that tin supplies show little if any improvement, with prices holding at high levels. The lead market remains firm and unchanged with fair stocks available. Spelter is weak and antimony also shows a weaker tendency.

COPPER.—Reports from the United States indicate that producers are not anxious for business prior to the next price-fixing date, August 15. Higher prices are looked for as a stimulus to production, but whether these will be granted is unknown. Local conditions are unchanged, prices ranging around 30-32c per pound.

TIN.—Practically all tin coming forward is sold to arrive and offerings are by no means plentiful. Nominal quotations range from $1.10 to $1.25 per pound with the latter price being asked in some quarters for stock to arrive. Supplies are none too heavy and receipts uncertain.

SPELTER.—This metal is weak though prices have held unchanged locally at 10½c per pound. Supplies are equal to demands, which are rather small.

LEAD.—The market holds firm and unchanged. Fair supplies are available but little in the way of a surplus is being accumulated. Prices locally hold at 10½c to 11c per pound.

ALUMINUM.—No new developments have been recorded since last issue, prices holding around 50c per pound.

ANTIMONY.—Somewhat easier tone to the situation is noticeable at primary points and this has been reflected here, quotations ranging around 18c per pound.

PIG IRON.—Supplies are largely being absorbed in war work and whereas some difficulty is being experienced by manufacturers of commercial products, which might be termed non-essential, in getting supplies ,it is felt the real pinch has not yet come. War work must necessarily come first and as it is extended other industries must suffer to that extent.

Montreal, Que.—Reid Brothers, 511 St. Catherine St., have been given the general contract for three refrigerator buildings to cost $40,000 for the Harris Abattoir Co.

Toronto, Ont.—Contract has been awarded to the J. V. Gray Construction Co. for 120 ft. x 160 ft. extension to foundry building on Lansdowne Ave. by Canadian Allis-Chalmers, Ltd., Toronto.



CONTRACTS AWARDED

Sydney, N.S.—Urban Bros., have the plumbing and heating contract for a $4,500 residence for Malcolmn R. McLeod.

Winnipeg, Man.—The American Well Works, Aurora, Ill., have the general contract for pumping unit for the City Council.

Ottawa, Ont.—J. P. Band has been awarded the plumbing and heating contract for a residence being erected by Dr. Nulton Graham, 227 Clemow avenue.

St. Francois D' Assise, Que.—P. P. Gigure, Ltd., 52-56 des Fosses, Quebec, have the roofing, plumbing, heating and electrical work for $43,000 church for the parish.

St. John N.B.—J. H. Doody, 16 Canterbury, was awarded the contracts for the plumbing and heating of the church and Sunday school, St. David's Presbyterian Congregation.

London, Ont.—D. & G. Lynch, 62 Marchmont road, have the plumbing and the Pease Heating Co., 118 King E., the heating contract for $3,500 residence for Mrs. Gates, 115 Gothic avenue.

York Township, Ont.—The Grant Contracting Co., Ltd., 50 Front street E., have the general contract for the construction of a water main on Kenwood avenue for the Township Council.

Almonte, Ont.—Taylor Bros., Ltd., have the general contract, and the Gurney Foundry Co., Ltd., Toronto, the contract for furnaces for $36,000, heating system for school for the Public School Board.

St. Nobert Du Cap Chat, Que.—M. A. Guerin, Scott Jct., has the roofing, and La Cie G. Simard, 109 Dorchester street, Quebec, the plumbing and heating contracts for $75,000 church, etc., for the Roman Catholic Congregation.

Calgary, Alta.—The following contract has been awarded in connection with the erection of a $12,000 store building for the Merchants Bank, head office, Montreal; plumbing and heating, J. Ballantyne Co., Ltd., 11th avenue, W.

WORK CONTEMPLATED

Toronto, Ont.—Robins, Ltd., Kent Bldg., will erect twenty residences and want tenders for tinsmithing.

Toronto, Ont.—Thos. Edmonds, 12332 Shaw street, will erect two pair of residences costing $8,800 and will let plumbing and heating.

Toronto, Ont.—A. J. Bottrell, 742 Bathurst street, will erect two $2,000 two-storey brick residences, and wants tenders for plumbing.

Toronto, Ont.—Tenders have been received for plumbing, heating, hydraulic plungers and freight hoist for pumping station work for the Board of Control. Secretary, Thos. McQueen.

Kitchener, Ont.—The Canadian Consolidated Rubber Company contemplate the erection of eighteen workmen's houses to cost $2,500 each. Chief engineer, A. Y. Copeland.

York Township, Ont.—Township Council contemplate the construction of water mains on a number of streets at a total cost of $69,780. Engineer, Frank Barber, 40 Jarvis street, Toronto.

Sutherland, Sask.—Tenders have been received by the secretary, R. C. Desrochers, Ottawa, for the construction of water supply system for the Department of Public Works, Dominion Government.

BONDS TO BE TAX-FREE

An official statement from Ottawa sets at rest any uncertainty as to whether or not the bonds of the second Victory Loan would be taxable. The decision is in favor of the tax-free bonds. The statement is quite brief:

"The Government, after careful consideration, has decided that the bonds of the next Victory Loan will, like those of all previous issues, be free of all Dominion taxation.

"With such a large body of existing securities tax free it was felt that it would jeopardize the success of the new loan to make it subject to income taxation and attempt to float it at the same interest rate as the last issue.

DAVIS GAS-FIRED AND OIL-FIRED FURNACES

We commend to the notice of the trade an interesting illustrated brochure, which has been published by the Davis Furnace Company, the Diamond Foundry, Luton, Bedfordshire, England.

The Davis Furnace Company were very early in recognizing the important research and experimental work that remained to be done in connection with industrial heating methods, and no stone has been left unturned by them in elucidating the scientific principles underlying the efficient firing of furnaces by means of gaseous and liquid fuels, and the practical demonstration of the superiority of these alternative methods as compared with the use of solid fuel and its attendant unreliability and inconveniences. In pursuance of this progressive policy, the company have for a considerable time past maintained at their Luton works a completely equipped demonstration plant, consisting of a comprehensive range of their own standard productions, fitted up under practical working conditions, replete with compressing apparatus, pyrometry outfits, and all other necessary accessories, thus enabling interested clients to witness actual tests of furnaces designed for their own particular industries, and establishing to the point of conviction the desirability of adopting modern and scientific heating methods in the case of all replacements and extensions.

It is for the purpose of interesting furnace users in this important phase of their activities that the Davis Furnace Company have issued this illustrated brochure, which will be found to deal briefly with such features of their demonstration plant as may be presumed to be of general concern.

The publication deals in a very comprehensive manner with the Davis Furnace burners, power plant, main supplies, crucible furnace installation, natural draught furnaces, induced draught furnaces, largee industrial furnaces, and sundry furnace equipment.

ABOUT A GAS BY-LAW

In the June 1st issue of SANITARY ENGINEER some reference was made to a gas by-law. We stated that we thought that the time had arrived when such a by-law should be compiled and put into force in Toronto. By this we did not mean to infer that conditions were exceptionally bad in Toronto in connection with gas appliances or the way they are installed, but rather that wherever gas is used either for heating, cooking or lighting, there should be some by-law governing the installation of piping and apparatus generally.

Since then two more lives have been lost as a result of gas poisoning, and from evidence gleaned from the newspapers one is led to believe that combination gas and electric fixtures were used. We can scarcely understand how practical men could endorse the use of such fixtures except for reasons of lowering first cost of installation, and we venture to say that if an up-to-date gas by-law had been in existence such a type of fixture would not be approved.

However, the following items from

"The Globe" tend to give us some encouragement, as it would appear from them that at last someone is taking notice, and that some by-law will shortly be put into force:

Hotelman Arrested at End of Gas-Poisoning Inquest

Criminal negligence was the charge on which John Blackhall, proprietor of the Kirby House, Queen Street West, was arrested after the presentment of Coroner M. D. McKichan's jury at the Morgue last night, in connection with the deaths of Richard Goggin and William Lahey from gas poisoning. Acting Detective Strohm made the arrest after the jury had included in its verdic' the opinion that the proprietor of the hotel in which the men were stoping "was guilty of gross negligence."

Proprietor is Arrested

Blackhall was the first witness to testify at the inquest and shortly after midnight he was taken to Court Street station by Detective Strohm, and at an early hour this morning was still being held in custody. The investigation was held on the bodies of Richard Goggin and William Lahey, both farmers of Madoc, Ont., who were asphyxiated by illuminating gas while sleeping in Blackhall's hotel on the evening of June 7.

Policeman Gives Evidence

Plainclothesman Ward, of Dundas Street West station, in giving his evidence, stated that when he was sent to investigate he found both men lying dead in bed, and in his opinion they had been dead for some time. A fixture over the bed was equipped with both electric and gas fumes when the officer entered the room.

John Blackhall, proprietor of the hotel, when questioned by the Crown as to whether or not he was in the habit of turning the gas off at the meter late at night and turning it on again in the morning, remarked that the gas had not been turned off at the meter for over a week previous to the morning of June 8.

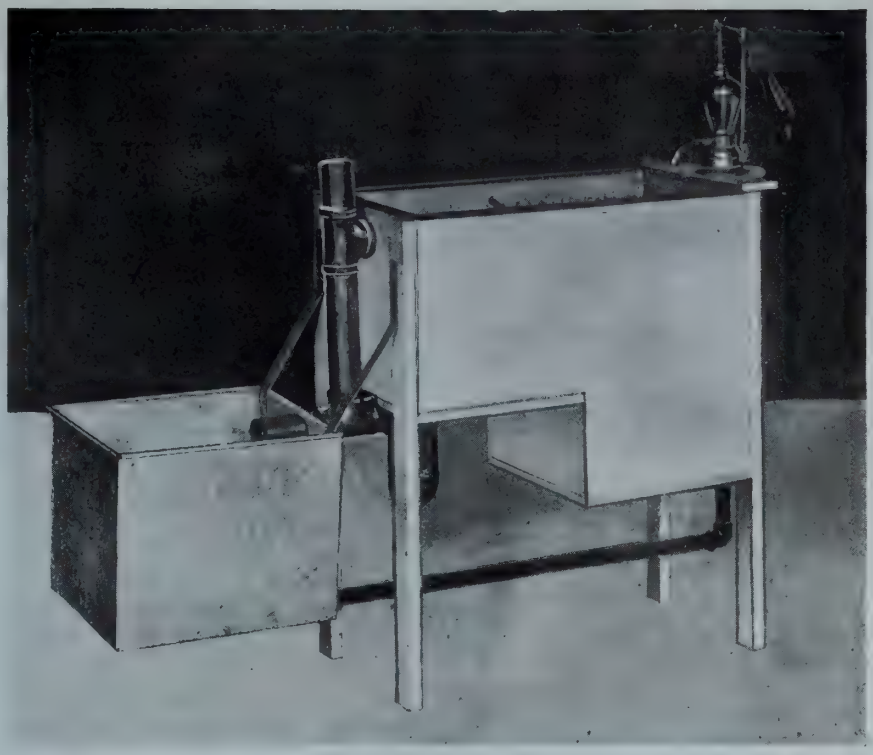
Since the above was written it transpires that the hotelman in the case referred to was exonerated.

Safeguard the Public

Dr. C. J. O. Hastings, M.O.H., is making a full and comprehensive report on the manufacture of gas and the control of leakages; also recommending regulations with a view to making gas appliances as nearly accident-proof as possible.

Only electric lighting, he strongly urges, should be used in hotels and lodging houses, in order that guests may not suffer asphyxiation through carelessness or accident. Many of the recent cases of death from this cause have been due to accident or ignorance, and the only adequate way of protecting these people is through removing all possibility by changing the gas lighting to electric.

"Where public entertainment is provided and people are accommodated who are not accustomed to city lighting, they should not be subjected to the dangers of gas," the doctor states.



Working model of septic tank made and used by the editor of Sanitary Engineer in demonstrating the working of a septi : tank, before the pupils of the plumbing class at the Toronto Technical School.

The practice of turning off the gas at the meter at a certain hour of the night is strongly condemned by the M. O. H. In such cases the meter may again be turned on at an early hour in the morning before the guest, on whom the light has been turned out, is awake, and asphyxiation results.

Much Tubing Defective

Much trouble has been caused by leaking tube connections. Even the best of these may in time become porous and allow gas to escape. Many of the types of tubing now on the market are not even good rubber or composition, and some are merely parafined paper, which may develop leaks on being badly bent.

The doctor is strongly recommending that regulations regarding the type of fittings and connections used should be carefully examined and only approved types be permitted.

The Health Department intends to have a test case in connection with the method of installing some appliances. In the upper room of a city lodging house a man used a flexible connection between a fixture he had to heat water and the gas pipe. This tube was found to be leaking, and it is likely that both the roomer and the proprietor will be brought into court under the Public Health Act, on the contention that the gas appliance is in a dangerous condition.

FACTORY SANITATION

(Continued from page 21.)

not be wasted going to and fro. In large plants one building erected in a central location would be advisable, and when more than one room is advisable, their number and locations would depend upon local conditions.

There is another thing to consider where male and female workers are employed, that is, that the lavatory accommodation shall be in either separate buildings or far removed from each other.

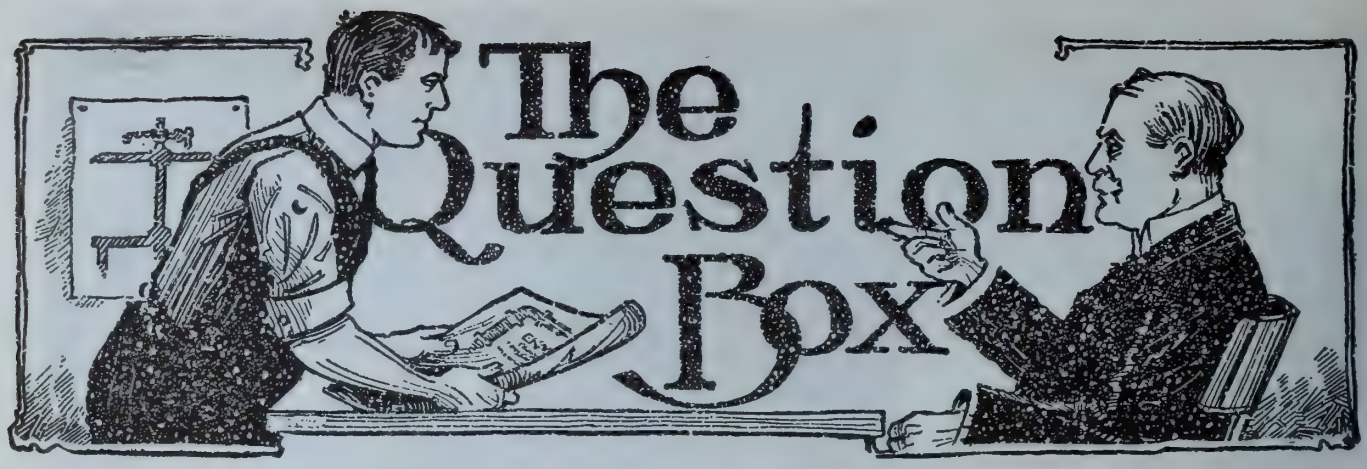
The lower illustration on page 21 is a photographic reproduction of actual conditions. Moral decency requires that where males and females are employed, such conditions as shown should not be tolerated for one moment.

Ignoring the filth of such a double accommodation for "males" and "females," close proximity of fixtures separated only by a thin board partition, far from sound proof, and the common approach, such accommodations would be morally objectionable even if they were sanitary, clean and well lighted and ventilated.

Every employer should apply the golden rule in business, and should recoil with horror at the thought of a daughter of his being forced to avail herself of such accommodations as is shown in this case. Every employer should treat the daughters of other men as he would like his own daughter treated, by providing safe, sanitary and absolutely separate toilet wash room and locker conveniences.

(Continued in future issues.)

Sidney, N.S.—The Dominion Iron & Steel Co. has awarded the contract for the foundations for the new plate mill to Bate, McMahon & Co., of Ottawa.



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published--Description of Jobs Done or Shop Kinks Are Also Invited.

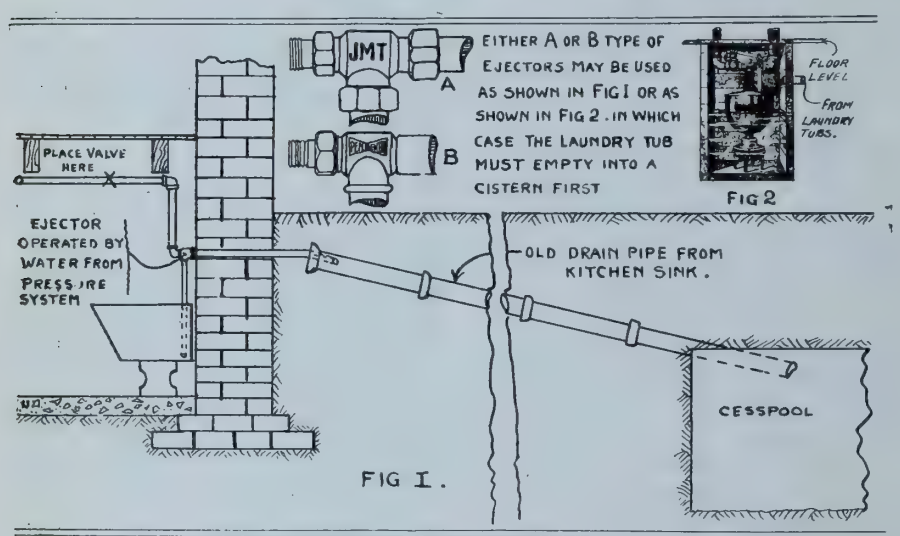
HOW CAN THESE LAUNDRY TUBS BE DRAINED?

Editor SANITARY ENGINEER:

I have just fitted up a farm home with plumbing, pneumatic water system and furnace. The farmer's wife would like to have a pair of laundry tubs installed in the basement, but the septic tank is too high to permit their draining into the septic tank and a pump would mean a lot of work. Here is the way conditions are:

Before I installed this plumbing they had just a sink in the kitchen, and the waste ran into a cesspool. From the description furnished me of it by the farmer, I found that the cesspool is five feet lower than where the tubs would be installed, and it is really a big hole eight feet square, and shored in with cedar posts, then the hole is filled with stones. It has been in use about 10 years. I was just wondering if this cesspool could be used to drain these tubs into. Any information that will help me get this laundry tub job will be appreciated.

R. R. S., Manitoba.



There are several ways by which laundry tubs may be drained when situated as described by our inquirer. A regular automatic cellar drainer could be used, operated by a small electric motor. These outfits comprise a steel or cast iron receiver. With a motor working in a vertical position, a small rotary or centrifugal pump is set in motion by the motor, and this is in turn started when the receiver fills, there being a float in the receiver There would be no harm done by using outfit referred to and allowing the discharge from the laundry tubs into the cesspool.

Another method could be adopted which in capital expenditure would not be as expensive.

Procure a water ejector such as manufactured by the Penberthy Injector Co., Windsor, or the James Morrison Co., These can be bought from any jobber, and connected up with the pneumatic water system as shown in Fig. 1, allowing the discharge to flow into the cesspool.

This scheme would not be advisable if the discharge was allowed to empty into the septic tank because there would be not only the waste water from the laundry tubs to contend with, but also the water used from the pneumatic water system. Whereas if the cesspool is used no harm will be done.—Editor.

ONDOL HEATING

The Japanese who have migrated to Korea have found their charcoal fires unsuitable and have had to devise another method of heating to combat the severe winter weather of the peninsula. In the system used, which the natives call ondol, the entire floor surface is utilized for warming. The floor of the house is first made with a layer of mud, which is intersected by three or four flues radiating from the fire-place and converging into the chimney at the other side of the building. Large slabs of stone are laid over the mud-floor, the joints being made air-tight with clay. A layer of clay is then added on top of the stone, and finally the whole is covered with thick oiled paper. The fireplace is outside of the wall and the smoke and heat pass through the flues in the floor to the opposite side of the house. In this way the whole room is effectively warmed, no other stove being needed in it even on the coldest days. This method of warming is merely a revival and modification of the old Roman hypocaust. The Farthest East stretches back two thousand years for a practical apparatus to warm its extremities.

NO INDUCEMENT

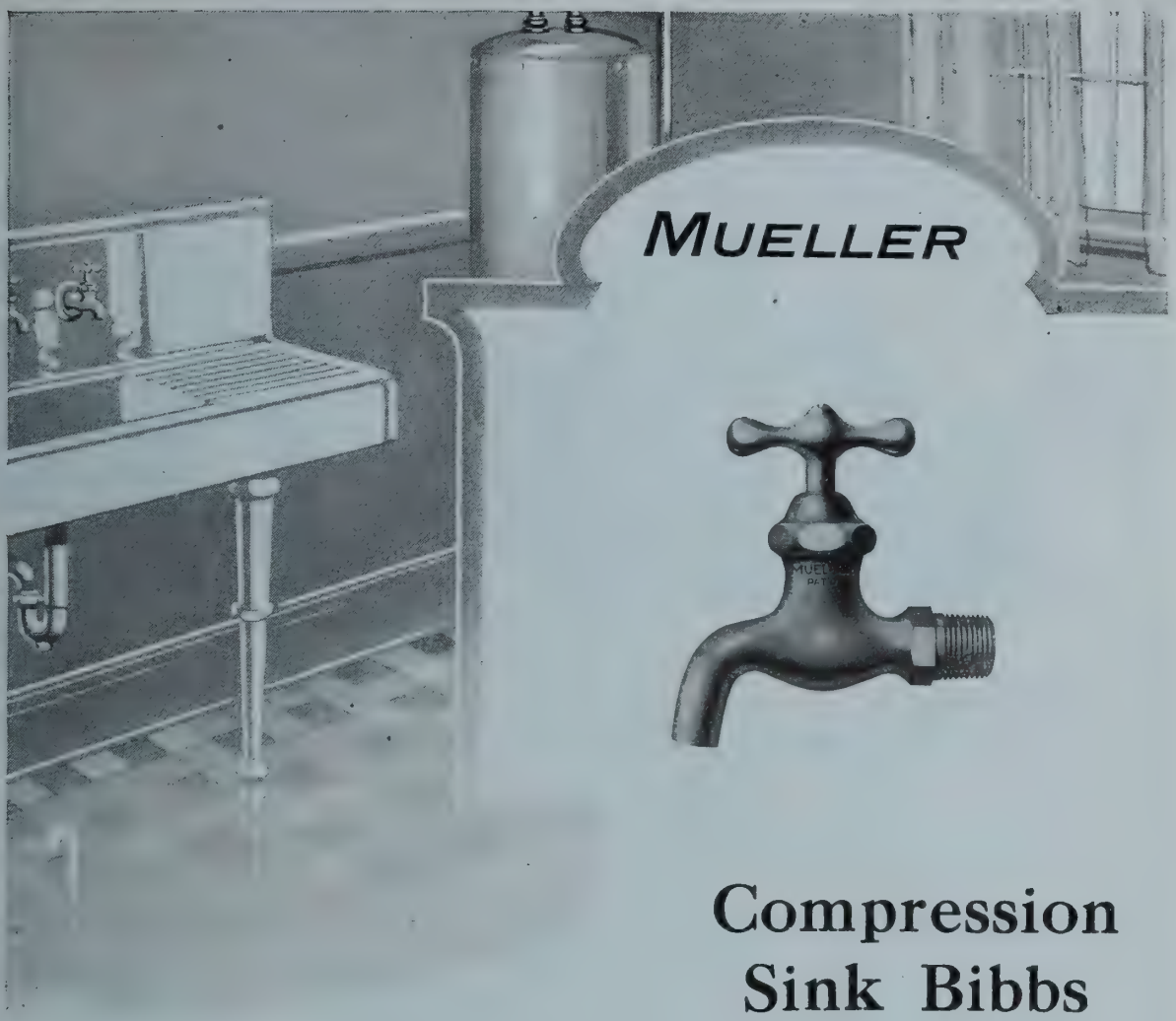
A woman, very careful of her reading, asked the late Hamilton W. Mabie, one day, to recommend to her a really good novel.

"Why not try 'A Kentucky Cardinal?' suggested Mr. Mabie.

"No," replied the woman. "I don't care for theological works."

"But," said Mr. Mabie, "this cardinal was a bird."

"That may be," answered the woman icily, "but that wouldn't recommend him to me."



Compression Sink Bibbs

SIMPLE elegance, combined with superior strength and wearing quality, is what you give your customer when you install **MUELLER** goods.

The many advantageous features of **MUELLER** compression bibbs give maximum service from the bibb as a whole. The anti-spreading device that breaks up the whirling motion of the water and the corrugated stem and handle, allowing the handle to be set at any angle without becoming loose or wobbly, are only two of these features.

MUELLER Bibbs are the best the market affords. Write for prices.

H. Mueller Mfg. Co., Limited

SARNIA CANADA

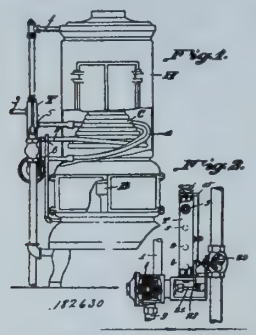
MUELLER

New Patents

No. 182,630.

Adolfe Beler, Pittsburg, Pennsylvania, U.S.A., 5th March, 1918; 6 years. Filed 21st January, 1918. Receipt No. 290,038.

Claim.—1. A fluid heater including a fluid receptacle having an inlet and an outlet, a burner, a fuel controlling thermostat, means for conducting fluid from the receptacle outlet to the thermostat, said thermostat having an outlet, a fuel



182,630. Fluid Heater.

controlling valve, means operated by fluid under pressure while circulating through the receptacle to the thermostat and out of the thermostat for opening said valve, and a normally inactive supplemental means having an inlet and an outlet in communication with the thermostat, for effecting continuous circulation of fluid when heated by the burner through the thermostat and independently of the action of the pressure operated means.

2. A fluid heater including a fluid receptable having an inlet and an outlet, a thermostat in communication with said outlet and adapted to be heated by fluid passing from the receptacle to the point of consumption, a burner, a fuel controlling valve, means operated by fluid under pressure flowing into the receptacle for opening the valve, means operated by the thermostat for closing said valve independently of the action of the pressure operated means, and a normally inactive supplemental means heated by the burner for setting up a constant circulation of heated fluid through the thermostat to automatically close the valve when the temperature of the fluid is raised to a predetermined degree, irrespective of the action of said pressure operated means.

No. 182,631.

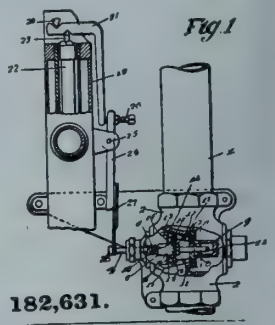
Adolf Beler, Pittsburg, Pennsylvania, U. S. A., 5th March, 1918; 6 years. Filed 21st January, 1918. Receipt No. 290,032.

Claim.—1. The combination with a valve casing having a seat and a stem mounted to slide within the casing, of a valve slidably engaged by the stem, opposed resiliently connected links carried by the valve, and means interposed between the links and stem for directing the valve onto or away from its seat under the action of said connection when the stem is brought to either of two predetermined positions respectively.

2. The combination with a valve seat and a valve of a stem slidable within the valve, opposed links pivotally connected to the valve, a resilient connection between the links, means interposed between the links and stem for drawing the valve onto and pressing it away from the seat under the action of said resilient connection.

3. The combination with a valve seat and a valve of a stem slidable within the valve, opposed links pivotally connected to the valve, a resilient connection between the links, means interposed between the links and stem for drawing the valve onto and presing it away from the seat under the action of said resilient connection, and co-operating means upon the valve and stem for limiting the relative movement of said valve and stem.

4. The combination with a valve seat and a valve o fstem slidably mounted within the valve, opposed links extending from the valve, a spring connection between the links, means interposed between the stem and links for directing the valve onto or away from its seat under the action of the spring when the stem is brought to either of two predetermined positions, and thermostatically controlled means for actuating the stem.



182,631.

Valve Mechanism.

5. The combination with a valve seat and a valve, of a stem slidably mounted within a valve, opposed links extending from the valve, a spring connection between the links, means interposed between the stem and links for directing the valve onto or away from its seat under the action of the spring when the stem is brought to either of two predetermined positions, a spring for holding the stem normally in a predetermined position, and thermostatically controlled means for shifting the stem out of said position.

ABOUT ADVERTISING

By One of Us.

I MET a friend of mine on the street car the other day and he was trying to be funny. He said to me, "Say, Mr. N., did you ever notice a dog when he goes to lay down?" I said I had not. Said he, "Well a dog always turns round twice before he lays down." And I bit by asking my friend why. "Because he thinks one good turn deserves another."

This friend of mine, however, was one of those fellows who believe they are saving money by not advertising, so, as the two of us were travelling from one end of the city to the other, I thought I'd ask him "one." So I asked him if he had eaten a duck egg lately, he replied that he had not. So I then asked him if he could tell how it was that hens' eggs were more popular than ducks' eggs.

He began to be a little backward and though there was a "catch" in the question, and noting his backwardness, I replied that the hen and rooster believe in advertising.

No sooner an egg is laid than the row begins. The hens cackle and the rooster gets on the fence or on top of the barn and raises Sam Hill, and Mr. Farmer or housewife knows there are eggs. That's real advertising, and it pays.

Not so with the duck. She lays an egg, sneaks out as quiet as a mouse, the drake never opens his clap, and that's not advertising. No, and duck eggs are not so popular as hen's eggs, though they're just as good, and bigger as a rule.

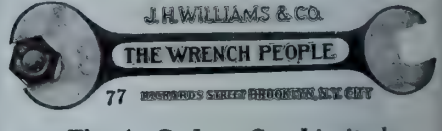
Williams'
"FALCON"
Waste Plug
Spanner
"SHOW US"



a plug (up-to-date) which a Williams' Drop - forged Waste Plug Spanner won't fit—yours "for nothing" if you win. A simple tool with extreme service-giving qualities, requires little space in kit (folding handle) and it is eve r l a s t i ngly " Johnny-on-the-spot" in basin, sink, etc., jobs. Price low.



Your dealer will serve you



The A. G. Low Co., Limited
77 Pacific Ave. Saskatoon, Sask.

Agents for Manitoba, Saskatchewan, Alberta and British Columbia



There's Money In IT for YOU!

Heating Engineers will welcome this, the latest and greatest invention in connection with their profession.

"A 'perfect' heating system."

That is the only description that can be given to the "Dodd Heating System"—eliminating, as it does, all the faults and shortcomings of the coal-fired boiler.

THE DODD GAS HEATER

Fired by gas (the cleanest of fuels); automatically controlled and regulated by a Thermostat. Constructed on scientific principles—fool-proof—and above all economical in operation, the "Dodd" is the ideal heater—it may be used wherever a hot-water, steam or vapor system is installed.

The owner of a Dodd Gas Heater has no furnace trouble—no cellar work.

To obtain heat, it is only necessary to light the pilot-light—set the Thermostat to the degree of heat desired—and leave the Dodd to do its work. It will "carry on" night and day—week in, week out—throughout the Fall, Winter and Spring, burning only sufficient gas to give the necessary heat. We have faith in our product—a mighty faith. We have tested the Dodd Heater under all conditions—and can show you recording charts, fuel-consumption accounts, consulting heating engineers' certificates. Moreover, we are prepared to give a strong guarantee with every Dodd Gas Heater.

Your clients want to know about this perfect heating system—we want you to tell them all about it. In order to do this, you must investigate our claims—and understand our system. Spend a little of your time in making an investigation.

We will advertise this Heater extensively. You will be questioned by your clients—have your information ready. Be posted. Know the fine points of our system, so that you can talk it intelligently.

Co-operate with us in introducing to the public the ideal heating system—one that will bring you added prestige and substantial profit.

We will help you in every way possible—let us explain our sales plan.

THE DODD HEATING SYSTEMS LIMITED

34 VICTORIA STREET - - - TORONTO, ONTARIO

Your Customers Can Get Hot Water At Less Cost than with Any Other Heater

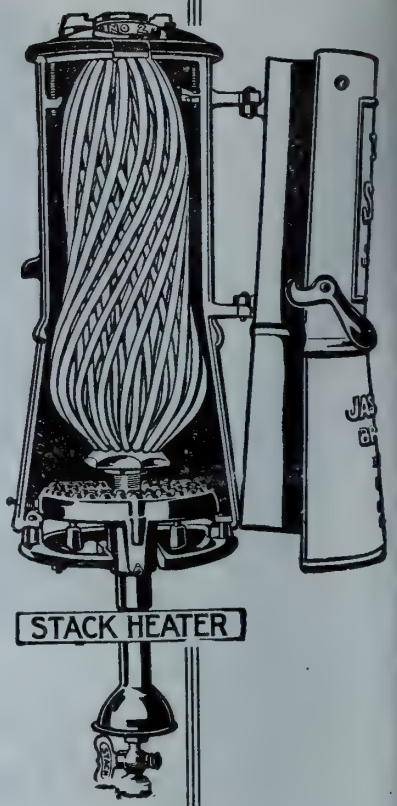
The principle on which the Stack operates is so simple that anyone can instantly grasp the reason of its efficiency and superiority.

Show the prospect the interior of the heater.

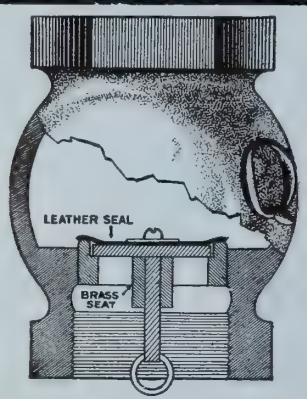
The copper tubes rising almost perpendicular break the water up into small columns entirely surrounded by heat from the gas flame. Rapid circulation carries the water out of the heater without giving time for the deposit of sediment, thus preventing the tubes from being coated and losing their efficiency.

The Stack heats water in one minute at **less cost.**

When writing, ask about other profitable Morrison lines.



James Morrison Brass Mfg. Co., Limited
93-97 Adelaide Street West - TORONTO



This is a "Q" Foot Valve

And it Just *CAN'T* Leak

There are more pump troubles caused by "leaky" valves than from all the wear and tear which occurs in the average life of a pump.

The "Q" valve will overcome all priming troubles, and water once raised above it, through the suction line, will not leak out.

If you want the pumps you instal to give maximum, you will require to use the only valve on the market that JUST CAN'T LEAK.

Made in sizes from 1 to 8-inch.

R. MACDOUGALL CO., LTD.
GALT., CANADA


OPEN VIEW NO. 10-A.


TOP VIEW NO. 10-A.

The CEILING PLATE that's better

THE NO. 10—A NARROW FLANGE PLATE IS A STEEL HINGED PLATE, FLANGES ¾" WIDE. HIGHLY FINISHED. ESPECIALLY DESIGNED FOR TWIN CONNECTION "NARROW."

The split ceiling plate is coming more and more into use than ever and ALWAYS GIVES A NICE FINISH, because it can be attached to mains and risers at the very last, and is not exposed during completion of a building on the floors.

High quality at the right price.


Gem No. 4.

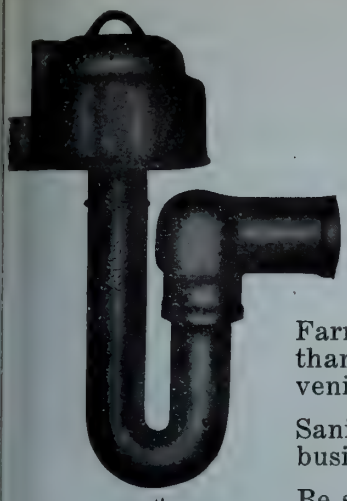
Gem No. 4 Automatic Air Valve

Made from the best brass obtainable. Pressed shell and pressed brass base which eliminate danger from blowholes, which is a fault with cast bases.

Write for catalog showing our complete line of specialties.

The BEATON & CADWELL MANUFACTURING Co.
New Britain, Conn.

Eastern Agent: J. R. Devereux & Co., 358 Beaver Hall Square, Montreal. Western Agent: A. E. Hinds & Co., Chamber of Commerce, Winnipeg.



Time to go out *Strong after Rural business!*

Farmers were never in better financial condition than just now. More than ever are they willing and ready to spend money on home conveniences.

Sanitary Engineers should therefore go out strong NOW for this rural business while opportunity and weather conditions are ideal.

Be sure and specify the permanent and reliable "Anthes" Syphon and Soil Pipes. You'll secure future business in that neighborhood because of service rendered. Anthes has no superior for permanence, quality and price.

Specify "ANTHES" line from your jobber.

ANTHES FOUNDRY LIMITED.

TORONTO **WINNIPEG**

Pipe Fittings

Made in Canada



Brand Pipe Fittings, etc., give a service and satisfaction that will invariably get you re-orders and much new business as well.

A trial of the goods will prove this claim.

CAST IRON FITTINGS

With this brand mean fittings made with iron of high tensile strength—proper proportions and correct tappings.

RECESSED DRAINAGE FITTINGS

MALLEABLE FITTINGS

With this brand mean fittings made of Air Furnace Refined Iron, reamed and tapped to gauge with perfect threads.

Standard and Extra Heavy Flanged Fittings and Flanges. Galvanizing Malleable and Gray Iron Castings of all Kinds.

International Malleable Iron Co., Limited, Guelph, Ontario, Canada

KING BOILERS

Circulate Perfectly
Heat Quickly
And Save Fuel

Drive These Facts Home
'Twill Mean More Sales



The double-barreled argument of quick-heating and fuel-saving advantages afforded by installation of King Boilers means more this year than any previous year in history.

The thin waterways in the "King" mean quickly heated water, perfect circulation, and a SAVING IN FUEL.

Very shortly after the fire is lighted in a King Boiler hot water reaches the radiators.

Write for prices.

Steel and Radiation, Limited

Head Office, FRASER AVENUE, TORONTO
304 University Street, MONTREAL **101 St. John Street, QUEBEC**
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Pipe and the Public Welfare

By R. C. McWane
A Book Just Off the Press

Every sanitary engineer should be the possessor of this book. It deals with pipe making of all kinds, cast iron, wrought iron, steel, wood and tile pipe. It is valuable because it gives the users of pipe a true idea of how pipe lasts under various conditions when in service.

Price $1.00 Postpaid

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University Ave., Toronto

The Wrench of 25% Greater Efficiency

TRIMO PIPE WRENCH



Two new features have been recently added to the Trimo Pipe Wrench, namely Nut-Guards, in all sizes, and unbreakable steel frames, in leading sizes.

The Nut-Guards prevent the accidental rotation of the nut while in use.

These improvements add 25% to the usefulness of the tool.

The Trimo Pipe Wrench is made with wood handles in 4 sizes, 6-in., 8-in., 10-in., 14-in. and in steel handles in all sizes, 6-in. to 48-in. inclusive.

All Trimo Pipe Wrench parts are interchangeable.

The inserted jaw in the handle can be readily replaced when worn, thus adding to the life of the tool.



Nut with Nut-Guards



Inquiries from Importers and Dealers Solicited. Send for Catalogue No. 55.

TRIMONT MANUFACTURING CO.

CableAddress: Triwrench
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Roxbury (Boston) Mass., U.S.A.

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How 24,000 Fitters Added $1,000 to Their Profits Last Year!

IF you want to find out where a fitter stands—whether he is making money—ask him what he knows about the newest things in the business.

Ask him if he is using the latest heating systems and devices. Ask him if he is using up-to-date boilers — the best **valves, pipes** and **fittings?**

Ask him if he is using "X" Boiler Liquid!

If he is a shrewd, thinking fitter, he'll tell you he doesn't dismantle and weld leaky or cracked boilers any longer. He has found out how to give his customers a better job—and make more money for himself.

In fact, last year over 24,000 fitters used "X" Boiler Liquid—and almost every one added about $1,000 in additional profit to his income.

"X" Liquid is simply poured into the boiler. In 30 minutes it will repair every leak or crack—and make the boiler as good as new. No time is lost. No tools need be carted. No hanging around on the job.

With "X" Boiler Liquid you know in advance the time the job will take. So you make a flat price—get a definite profit—and save a lot of argument with a cranky customer.

Many enthusiastic fitters tell us that they consider "X" Boiler Liquid the greatest step forward that the business has seen in ten years!

And in addition to making a Scientific Repair "X" Liquid will prevent Rust, Scale and Foaming!

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"X" is not a cement or powder. It is a LIQUID. You should beware of dangerous imitations of "X" in solid or liquid form. These imitations clog the air valves. "X" Liquid is guaranteed not to be harmful—and will positively do all we claim or your money will be returned.

"X" LABORATORIES

676 Washington Street, Boston, Mass.



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Trimont Mfg. Co., Roxbury, Mass.

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L. Wolff Manufacturing Co., Chicago.

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Simplex Manufacturing Co., Chicago.

Rubber Goods
Canadian Consolidated Rubber Co., Ltd., Montreal.

Septic Tank Valves and Syphons.
Anthes Foundry Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

Solder.
Canada Metal Co., Ltd., Toronto.
Hoyt Metal Co., Toronto.

Second-Hand Pipe
Consumers Metal Co., Ltd.

Steam Specialties.
Dart Union Co., Ltd., Toronto.
C. A. Dunham Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Kerr Engine Co., Walkerville, Ont.
James Morrison Brass Mfg. Co., Ltd., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

Steam Traps.
Geo. W. Cole Co., Ltd., Toronto.
C. A. Dunham Co., Ltd., Toronto.
Farnsworth Co., Conshohocken, Pa.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Smoke Test Machines.
James Morrison Brass Mfg. Co., Ltd., Toronto.

Testing Plugs.
James Morrison Brass Mfg. Co., Ltd., Toronto.

Tools.
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Trimont Mfg. Co., Roxbury, Mass.
Williams, J. H., & Co., Brooklyn, N.Y.

Unions.
Canada Metal Co., Ltd., Toronto.
Dart Union Co., Ltd., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

Vapor Heating Systems.
C. A. Dunham Co., Ltd., Toronto.
Moline Heat, Moline, Ill.

Vitro Tanks.
Galt Brass Co., Ltd., Galt.

Vacuum Systems of Heating.
C. A. Dunham Co., Ltd., Toronto.

Ventilators
Bicalkey Fan Co., Buffalo.

Water Supply Systems.
Empire Mfg. Co., Ltd., London and Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Hurley Machine Co., Toronto.

Make NEW Business from OLD Buildings



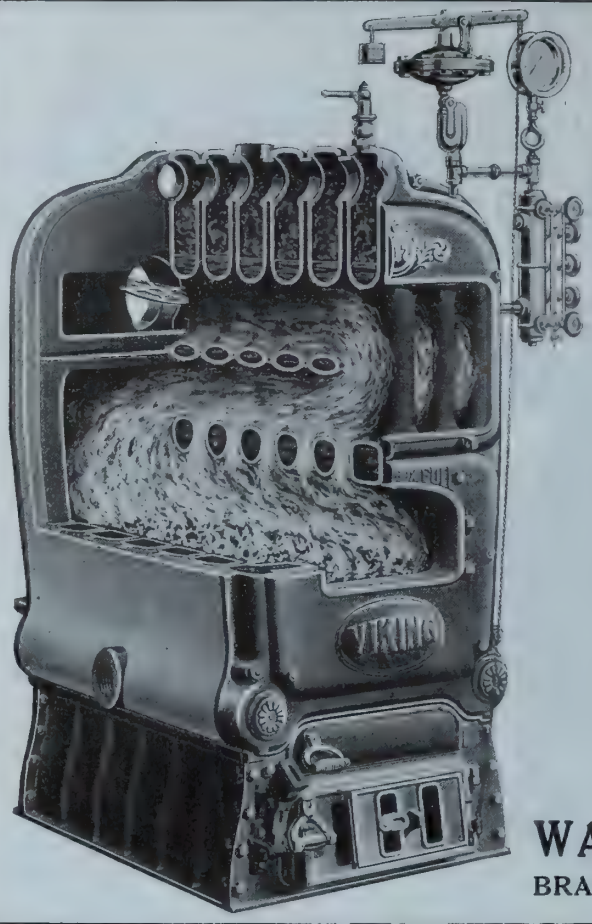
The Mark of Quality in Plumbing

In remodeling Homes, Schools, Business Houses or Factories and for new buildings insure Plumbing satisfaction by using Wolff products, the standard of plumbing value for over sixty-two years.

L. Wolff Manufacturing Co.

General Offices and Storerooms: 111 N. Dearborn Street

CHICAGO



Just Look at the Fire Travel

Our "VIKING" BOILERS

For Steam or Hot Water

are giving great satisfaction in all parts of the Dominion.

Fitted with government regulation trimmings, ensuring safety. Every section is tested before leaving the factory.

Ample sized flow and return tappings ensure steady water level. They are easily regulated and kept clean.

WARDEN KING, LIMITED, MONTREAL

BRANCH OFFICE: 200 ADELAIDE ST. WEST, TORONTO

WROUGHT PIPE

BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES Black and Galvanized All Sizes

Ask your jobber for CT Brand

CANADIAN TUBE & IRON CO., LIMITED

Montreal Works: Lachine, Can.

PIPE AND THE PUBLIC WELFARE

By R. C. McWANE

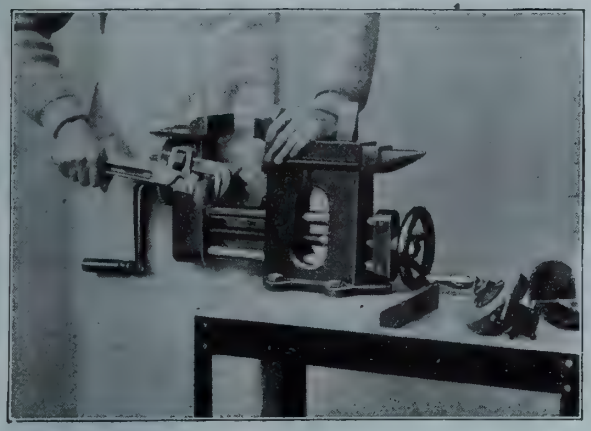
A Book Just Off the Press

Every sanitary engineer should be the possessor of this book. It deals with pipe-making of all kinds, cast iron, wrought iron, steel, wood and tile pipe. It is valuable because it gives the users of pipe a true idea of how pipe lasts under various conditions when in service.

Price $1.00 Postpaid

MACLEAN PUBLISHING CO., LIMITED, Book Dept., University Ave., TORONTO

THE
Stewart Handy Worker
An Equipment All in One



WEIGHS 90 POUNDS

The Equipment Comprises——

It's not a toy. It's a real combination of practical tools for practical people.

Write for full particulars.

A Pipe Vise
A Bench Vise
A Bench Grinder
A Two-Speed Drill
A Hardy Cutter
An Anvil

CHICAGO FLEXIBLE SHAFT COMPANY
12th Street and Central Avenue
Department H.W. CHICAGO, U. S. A.

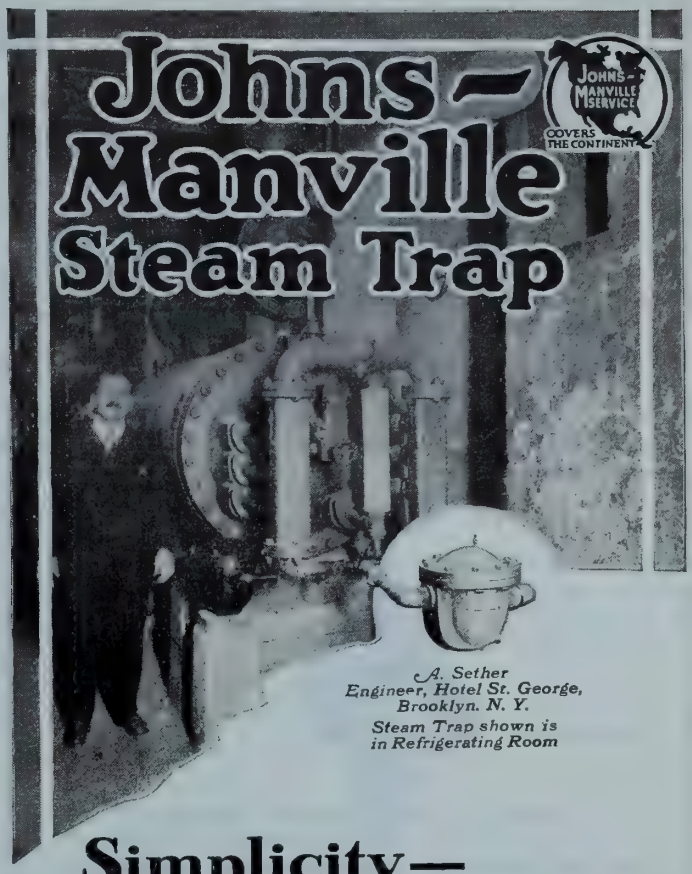
The Only Pipe Solvent That Can Be Used With Cold Water



DESOLVO has been in use in the United States for over 10 years and in Canada it is being endorsed by every one who has used it. It quickly clears blocked-up waste and soil pipes without injuring the fittings.

Drop a line on your letterhead, naming your jobber, and we will send you a trial can absolutely FREE.

Chamberlain Desolvo Co., Limited
110 Church Street
TORONTO
GENERAL OFFICES, PITTSBURGH, PA.



Simplicity—
the Mechanical Trouble Insurance

THE trouble a steam trap can make when it fails to operate properly is out of all proportion to its size. That's why the Johns-Manville Steam Trap appeals to the engineer—he appreciates that its 3-part simplicity offers little chance for trouble. No delicate mechanism to bind or wear out—no nice adjustments. Just a body, a discharge bushing, and one moving part—the hollow ball—that's all.

Steam leakage is prevented by the water seal; and the accurate balance between weight of ball, buoyancy, and steam pressure insures positive and continuous operation. No air-binding, for condensate carries air out with it through the discharge vortices. You'll find that once you've installed a Johns-Manville Steam Trap you can safely forget it. Prove it by testing one for yourself. Special bulletins on request.

THE CANADIAN
H. W. JOHNS-MANVILLE CO., LTD.
Montreal, Toronto, Vancouver, Winnipeg,
Hamilton London Ottawa



PIPE THREADING AND CUTTING TOOLS

One Man Can Thread up to 12 Inch.



Cuts Without Burring

No. 1 cuts from ⅛" to 1"
No. 5 cuts from ½" to 2"
No. 10 cuts from 2½" to 4"
No. 15 cuts from 4" to 6"

You cannot afford to expect your men to make horses of themselves. If they did they could not keep it up. Our tools save time, do better work and makes life worth living for your men.

Ratchet	Geared
No. 6—¾" to 3¼".	No. 41—2½" to 4".
No. 25—1" to 2".	No. 61—2½" to 6".
No. 26—1" to 2".	No. 80—4½" to 8".
	No. 90—9" to 12".

The Borden-Canadian Company
TORONTO, CANADA

"JUST ONE MINUTE"

To call your attention to the Famous B & C Floor and Ceiling Plates.
Our No. 15 style narrow flange designed for the Canadian trade.

One of many styles



No. 15

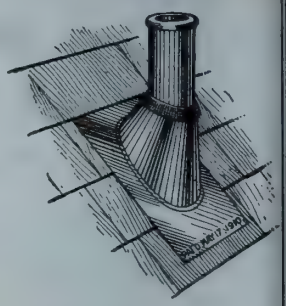
Handsomely nickel-plated or plain
Sizes ½ to 2"

Stock now carried by our Canadian Representative
W. H. CUNNINGHAM & CO., 183 Church St., TORONTO, Can.

THE BEATON & CORBIN MFG. COMPANY
Southington, Conn., U.S.A.

The SIMPLEX Adjustable Roof Flange

Fits any roof from ½ pitch to flat—just slide it down the pipe and it will conform with the pitch of the roof.



Trade Price 2" $1.00
4" $1.15

Made in all sizes—For sale by nearly every jobber

Simplex Mfg. Company - Chicago, Ill.
183 Church St., TORONTO, ONT.,
Canadian Representative: W. H. CUNNINGHAM & CO.,

Salesmen Wanted

Men who have worked up a connection with the trade are far more valuable to you than inexperienced men. The way to locate them is through your trade paper because wide-awake salesmen read it. When in need of salesmen use the Want Ad Page; the rates are 2 cents per word first insertion and one cent per word for each subsequent insertion, a charge of 5 cents extra is made for Box Number to cover cost of forwarding replies.

Second-Hand Pipe

1-2" to 4"

Black and Galvanized

Send us list of your requirements

Consumers Metal Company, Limited
14 St. John Street, MONTREAL
Works: LACHINE, QUE.

"HAUSE" PIPE JOINT CEMENT

For steam, water, air, oil, gas, gaskets, etc. The cement that cements. Sets like gum. Allows no leaks.

The Great Value of "HAUSE PIPE JOINT CEMENT" lies in its peculiar chemical properties which permits of its hardening and expanding after the joints are made up. In making up joints it has the same effect as a lubricant on the best graphite, and while the joints may be made and broken readily, a perfectly tight joint is maintained at all times. Comes in 1-lb., 5-lb., 15-lb., 25-lb., 50-lb. cans, 100-lb. barrels. Manufactured in ready mixed and powder form. Ask your jobber for prices, or write us direct.



Manufactured in Ready Mixed and Powder Form.

Made in Omaha, Neb., U.S.A., by

Chas. F. Hause Mfg. Co., Inc., Omaha, Neb.
Canadian Representative: Empire Mfg. Co., Ltd., Toronto.

THE BICALKY VENTILATOR

It's a real little wind engine



Is a positive suction fan that ventilates

The "Bicalky" will dispense with all auxiliary heaters on local ventilation systems.

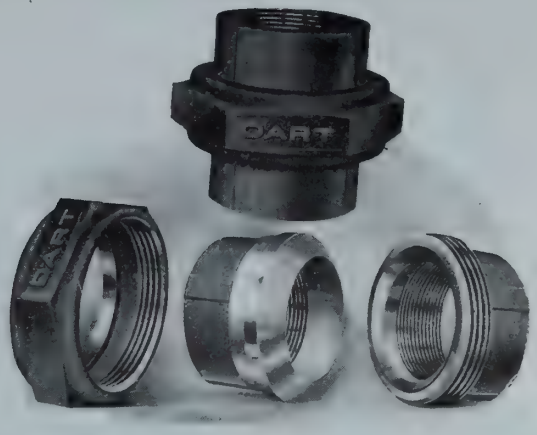
It is, as far as we know, the most scientifically constructed, self-propelled fan ventilator on the market.

Write us for full particulars.

BICALKY FAN CO.
BUFFALO, N.Y.
Canadian Sales Agents:
J. S. Chapman & Company
89 Jarvis St., Toronto



A *"Double Value"* Union and a *Business Builder!*



Dart Unions can be easily and quickly connected, whether in or out of alignment. *They save time.*

Bronze to bronze at the joints, Dart Unions are an assurance of permanency. They save *money.*

Truly a "Double Value" Union and a business-builder. Your jobber supplies them.

Manufactured by

Dart Union Co., Limited
TORONTO



There Are Lots of Gate Valves

Advertised and Sold



but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.
Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.
Approved by the Fire Underwriters' Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario

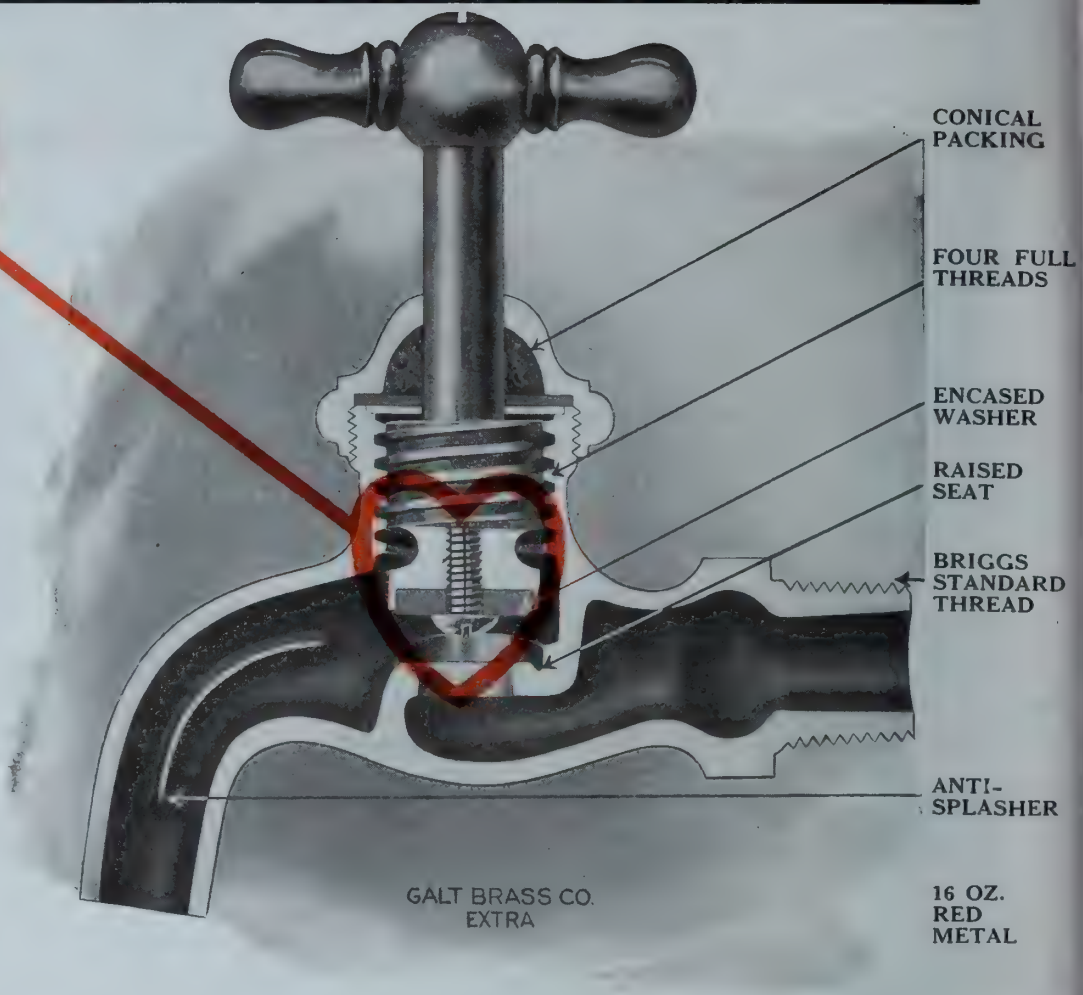
TRADE **PERFECTO** MARK

"GOOD" Washer

WARRANTY

Any article of our Manufacture proving defective will be replaced with TWO of its kind Gratis.

CONICAL PACKING, FOUR FULL THREADS, ENCASED WASHER, RAISED SEAT, BRIGGS STANDARD THREAD, ANTI-SPLASHER, 16 OUNCE RED METAL.



All **PERFECTO** Compression Work is now fitted with the GOOD MANUFACTURING COMPANY'S **GRAPHITE COMPOSITION SEAT WASHER.**

PERFECTO Compression Work is the only Compression Work made that is furnished with "GOOD" seat washers.

Having confidence in the Super-excellent qualities of **PERFECTO** products, the Good Manufacturing Company have entered into this arrangement.

Can you afford to be without PERFECTO Brass Goods?

Galt Brass Company, Limited

Galt, Canada

SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

Vol. XII. Publication Office, Toronto, September 1, 1918 No. 17

Empire Self-Closing Bibbs

BALL BEARING

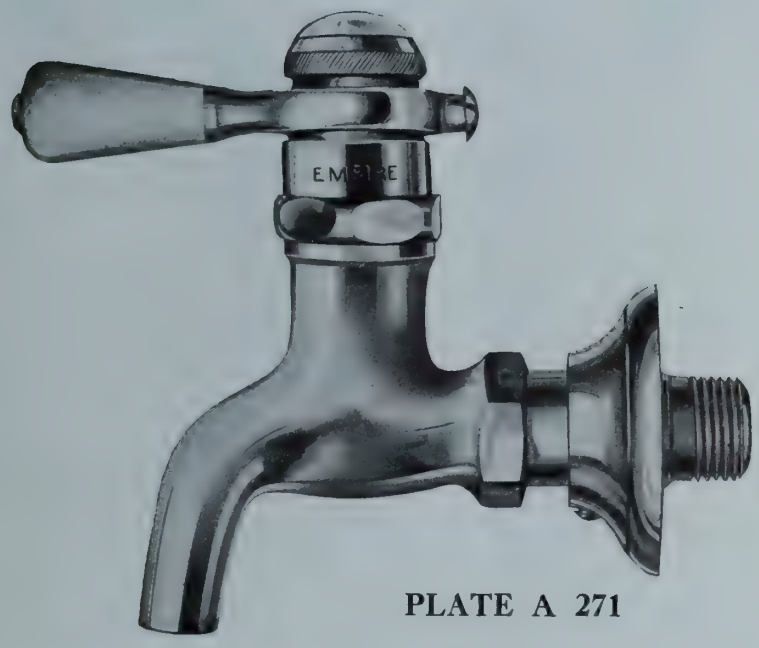


PLATE A 271

Ball Bearing Lever China Index Handle

If you want to build up bigger business, you need dependable goods. You need to install those goods that are made right and fully guaranteed.

Empire Self-closing Bibbs are made right; they are fully guaranteed, and do not waste water. One of the greatest economic wastes in our towns and cities is water. Most office and factory buildings and public institutions are on the meter system, and wasting water is a serious matter.

Empire Self-closing Bibbs will save the price in water rates in less than a year. It is unpatriotic to waste water, particularly these days, because every gallon of water needs some kind of power to pump same.

Get full information from us about this line right now, it's a real winner.

Empire Manufacturing Company Limited

LONDON TORONTO

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While



A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for BEAVER BRAND CAST IRON ENAMEL WARE

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

ONTARIO:
Monarch Brass Mfg. Co., 71 Brown St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes, 120 Lombard St., Winnipeg

CANADIAN CONSOLIDATED RUBBER CO. LIMITED
DOMINION
RUBBER SYSTEM
AND ASSOCIATED COMPANIES

BELTING - PACKING - HOSE

All over Canada, the Dominion Rubber System has an established reputation for making *good* rubber products. Whether it be Footwear, Tires, Raincoats, Druggists' Sundries or Mechanical Rubber Goods, the quality is second to none and the workmanship of the best.

That is particularly true of our Mechanical Rubber Goods. Dominion Rubber System Belts and Belting, Hose and Packing, etc., for industrial use, "stand up" and do the work expected of them. In these lines, quality and service have been linked together to such a degree that absolute satisfaction is assured.

If you have not proved this satisfactory service, write to our nearest branch and ask for one of our experts to discuss your belting, packing or hose problems with you.

Canadian Consolidated Rubber Co.
Limited

HEAD OFFICE - MONTREAL

Branches at Halifax, St. John, Quebec, Ottawa, Toronto, Hamilton, Kitchener, London, North Bay, Fort William, Winnipeg, Brandon, Regina, Saskatoon, Calgary, Lethbridge, Edmonton, Vancouver and Victoria.

Why Not Sort Up On Fuller Balls

and Be Ready to take care of the Fall Repairs

IN SIZES

3/8" 1/2" 9/16" 5/8"
11/16" 3/4" 13/16" 1"

BLUNT AND TAPERED PATTERN



The Ball with the Lasting Quality

NON-SPLITTING

Guaranteed to stand any degree of Hot or Cold Water

Canadian Wolverine Co., Limited

Chatham, Ontario, Canada

PIPE THREADING TOOLS

It is Evidence Like This



"Toledo" Geared Adjustable Threading Tool No. 2 making a cut and thread on a 4-inch bend in position. It was desired to install a steam separator above throttle of engine, and the whole job was satisfactorily completed without removing the pipe line.

which proves the extra value of "Jardine" and "Toledo" Pipe Threading Tools

"Jardine" and "Toledo" Pipe-Threading Tools cut clean, sharp threads with a minimum of muscular effort. They permit of one man doing work which ordinarily requires two. But even more important than this, they will work in any odd corner. Instance the job illustrated in the accompanying engraving. Here is a case where, with an ordinary tool, the whole pipe line would have had to be taken down. The tool paid for itself on that one job.
Investigate "Jardine" and "Toledo" Tools yourself. Ask us to send names of users in your locality. Then go and talk to these men in your own business and learn what they think of these good tools.

A. B. JARDINE & CO., Limited, Hespeler, Ont.

Sole makers of "Jardine" Pipe-Threading Tools.
Sole licensees to manufacture and sell Toledo Pipe-Threading Tools in Canada.
Agents, Winnipeg and West—Stanley Brock, Ltd., Winnipeg, Man.
Brockville and East—J. R. Devereux, 358 Beaver Hall Square, Montreal.
Belleville and West—W. H. Cunningham & Co., 183 Church St., Toronto, Ont.









FIVE WORKS—OVER 3,000 EMPLOYEES

It is our intention after the War to devote our energies to the intensive production of the following Specialities:

Gunmetal and Brass Valves and Cocks.
Steam, Water and Compressed Air Fittings generally.
Cast Iron Stop and Sluice Valves.
Semi-Rotary Pumps.
Extruded Brass and Bronze Bars.
Brass Bolts and Nuts, Studs and General Turned Work from the Bar
Cast and Malleable Iron Cocks and Pipe Fittings.
Pressure and Vacuum Gauges.
Injectors, Engine Governors.
Spraying Machinery.
Coppersmiths' Work.
"Stella" Brand Alloys, Manganese Copper, Silicon Copper, Ferro Zinc, Phosphor Copper and Tin, etc.

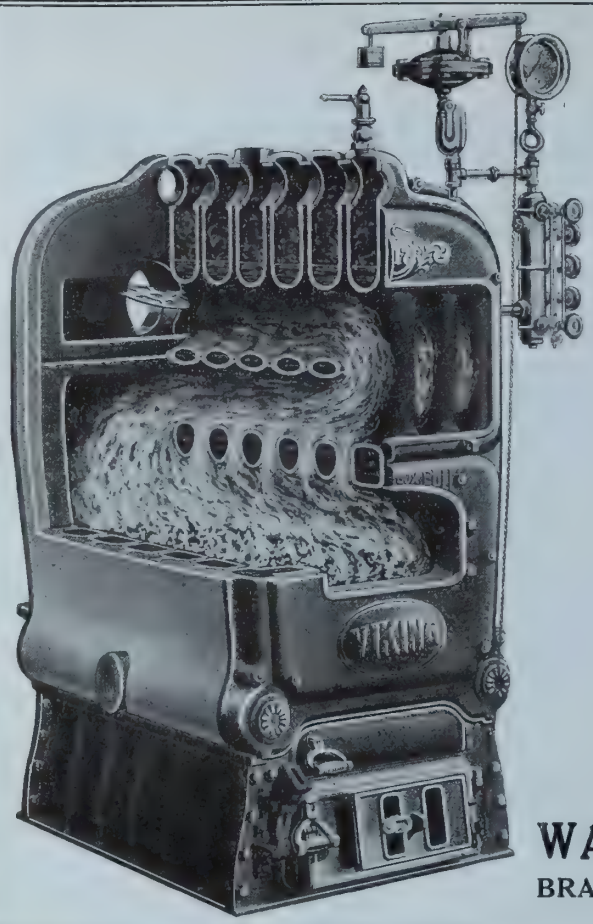
Business After the War

If you are interested in any or all of the lines mentioned and are in a position to take a hand in the energetic distribution of the same, please communicate with us NOW to our Head Office at the address below.

UNITED BRASSFOUNDERS and ENGINEERS, Limited

EMPRESS FOUNDRY

Cornbrook, Manchester, England



Just Look at the Fire Travel

Our "VIKING" BOILERS

For Steam or Hot Water

are giving great satisfaction in all parts of the Dominion.

Fitted with government regulation trimmings, ensuring safety. Every section is tested before leaving the factory.

Ample sized flow and return tappings ensure steady water level. They are easily regulated and kept clean.

WARDEN KING, LIMITED, MONTREAL

BRANCH OFFICE: 200 ADELAIDE ST. WEST, TORONTO



Pipe Fittings

Made in Canada

The Brand that has the Quality

MBrand Pipe Fittings, etc., give a service and satisfaction that will invariably get you re-orders and much new business as well.

A trial of the goods will prove this claim.

CAST IRON FITTINGS

With this brand mean fittings made with iron of high tensile strength—proper proportions and correct tappings.

RECESSED DRAINAGE FITTINGS

MALLEABLE FITTINGS

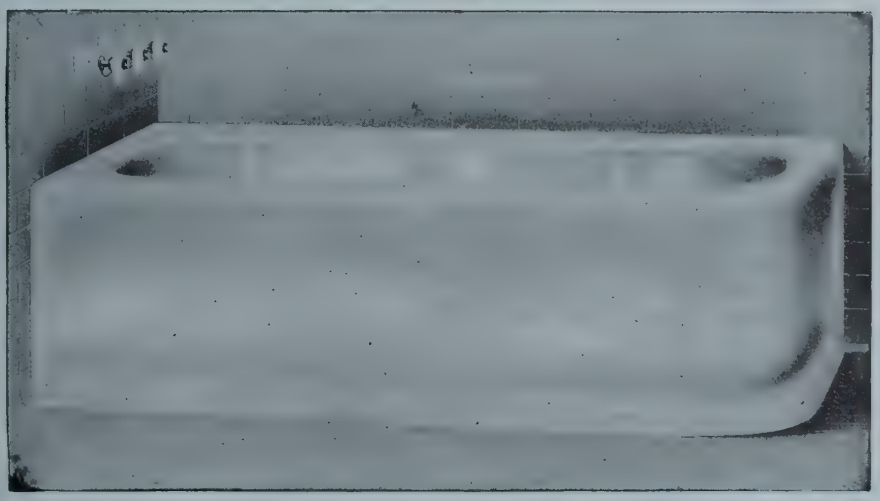
With this brand mean fittings made of Air Furnace Refined Iron, reamed and tapped to gauge with perfect threads.

Standard and Extra Heavy Flanged Fittings and Flanges. Galvanizing Malleable and Gray Iron Castings of all Kinds.

International Malleable Iron Co., Limited, Guelph, Ontario, Canada

"Standard"
"Perfection" Built-In Baths

Made in One Piece Enamelled All Over



These Baths represent the last word in design and finish, and are made to build into Right or Left Hand Corner or into a Recess.

The "Perfection" Built-in Bath is only 17½ inches high, therefore convenient. It builds into walls and floors, the absence of all dust-collecting cracks and corners, meaning bathroom sanitation.

Made in 5 and 5½ foot sizes.

Illustrations on request.

Write the nearest dealer.

Standard Sanitary Mfg. Co.
Limited

General Office and Factory, Royce and Lansdowne Aves., Toronto, Ontario

Toronto Store:
55-59 Richmond Street East

Winnipeg Showrooms:
76 Lombard Street

Hamilton Store:
20-28 Jackson Street West

Montreal:
4 Beaver Hall Square

Calgary:
31 Canada Life Building

Vancouver:
847 Beatty Street

"MADE IN CANADA"



"Ma says the *Lake's* the Best Bath Tub *But* that The *Aristocrat's* the Best Laundry Tub on Earth!"

The following are the important features of the famous "Aristocrat" Laundry Tub you will not see all-combined in any other laundry tub on the market.

Extra heavy, rustproof, zinc metal rim with solid soldered joints, thus eliminating any sharp, scratchy corners.

Nickel-plated strainers, with independent overflow, thus preventing tub filling above fixed height. This is a splendid improvement over old styles of tubs.

Round moulded corners, inside as well as outside.

Outlets placed well away from centre division and tub will drain itself dry.

Neatly designed substantial legs. Improved strength and quality from use of trap rock and best Portland cement, and will not absorb moisture.



THE ARISTOCRAT TUB IS PERFECT
Equipped with the Aristocrat Wringer Holder.

THE CANADA METAL CO., Limited

TORONTO, CANADA

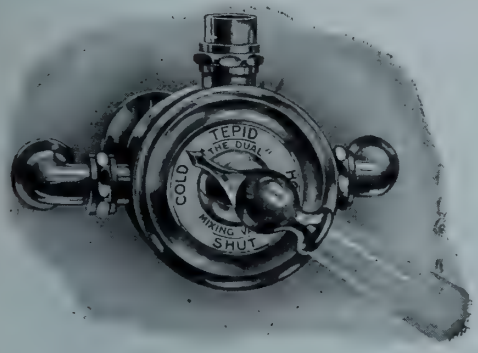
HAMILTON MONTREAL WINNIPEG VANCOUVER

We Have Everything for the Plumber

G. & W. G. GUMMER, LIMITED

EFFINGHAM BRASS WORKS, ROTHERHAM, ENGLAND

And at
9 Fenchurch St., London





"Dual" Mixer

A valve that really mixes Hot and Cold Water, and maintains a uniform mixture.

For ease of operation, simple construction and easy installation, it has set a new standard of efficiency.

Cold Water must be turned on first, no possibility of scalding.

Made in several forms for Showers, Sprays, Operating Rooms, etc.

At the well-known works of Messrs. Brunner, Mond & Co. these valves provide baths for 2,500 employees.

G. & W. G. GUMMER, LIMITED

Manufacturers of every description of

Engineers,' Plumbers' and Sanitary Quality Brassware



"It Can't Be Done"

You can't keep prices in your head these days
The question for you to decide is:

Do you want to waste your time searching through invoices and telephoning the wholesaler to find out costs and then spend some more time figuring out what you should charge the customer OR are you satisfied to pay us $3.00 per month to supply you with suggested selling prices on all standard plumbing goods?

Figure It Out This Way

Supposing you spend six or seven hours a week on this work: is it profitable or would it pay to pay us about seventy cents a week for the same work?

We Can Do This Work Better

This is not an idle boast, it stands to reason that when we are making a business of it we will naturally be in better touch with the markets than you are. Furthermore, the average customers' complaint of overcharge can be handled better if you show him a printed price list that is being used by about 200 of the best contractors in the country. One customer says he wouldn't be without it if it cost $20.00 a month.

Order Our Price Service For One Year—Try It Out!

The Henderson Business Service, Box 123, Brantford



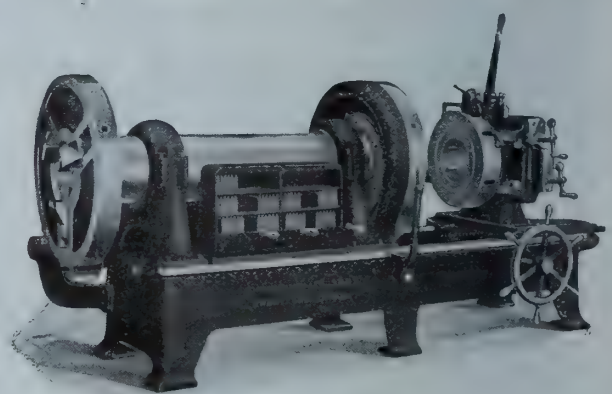
The Quickest, Cheapest and Most Sanitary Way To Remove Obstruction!

To move any obstruction in soil, waste or drain pipes, whether caused by frost or an accumulation of foreign matter, is to mix a can of **Desolvo** in cold water and pour down the pipe. Will not injure piping of any kind.

The process is just as simple as it sounds, and just as effective as it is simple and has been in use for over 10 years.

Chamberlain Desolvo Co., Limited
110 Church Street
TORONTO
GENERAL OFFICES, PITTSBURGH, PA.

Pipe Machines of Merit



THE HALL No. 8

Duplex Improved Gear Box Driven. Capacity 2½ in. to 8 in. inclusive.

Note the drive belt at rear out of operator's way. Elevated die cabinet, control lever and speed levers all convenient to operator's right hand. Sliding die head.

These machines are equipped with a friction clutch, enabling operator to revolve pipe a few inches, if necessary.

Pipe Machines ranging from ⅛ to 18".
Nipple Machines ranging from ⅛ to 4".
Roller Pipe Cutters ranging from ⅛ to 4".

Delivery from stock.

Write us for full particulars and prices.

John H. Hall & Sons, Ltd., Brantford, Can.

Seeing is Believing

How true this saying is, notwithstanding the fact that the artist of to-day can (almost) make a picture talk. Following this line of thought we are arranging in our Toronto Show-Room, 159 Richmond Street West, a display of Brass goods and a number of specialties in product, with an idea of suggesting new ways of getting business, product that can be sold from your show-room and customer can make instalation if necessary. Visit us during Exhibition week, as through shortage of help we will not have an exhibit on the grounds this year.

TRADE B.O.T. MARK





The Canadian Brass Company, Limited

Toronto Office: B.O.T. Building, 159 Richmond Street West

Galt, Ontario



Took a Chair in Borden's Kitchen

AND stayed right there until he got his place in the Cabinet. Such, in brief, is the story of how one Minister got in, as told by J. K. Munro in the course of an article in September MACLEAN'S.

"A Close-Up of Union Government"

This article will be found distinctly interesting and refreshing, for it appraises the various members of the Government on their nine-months' spell impartially, fearlessly and humorously. Mr. Munro is a member of the press gallery, and he has watched the Cabinet members with a close and critical eye for nine months, and he knows their weaknesses as well as their greatness, and he chronicles their foibles unerringly. It makes good reading.

The September issue contains the following other features:

"Our Mary," the first of a splendid story of Mary Pickford.
By Arthur Stringer

"Buried Alive!" a gripping story of underground warfare.
By Lieut. C. W. Tilbrook

"Less Petty Politics, More Common-Sense," a fearless discussion of the war situation. *By Lieut.-Col. J. B. Maclean*

Five splendid stories by well-known Canadian authors—Arthur Stringer, W. A. Fraser, Alan Sullivan, Archie P. McKishnie and Allen C. Shore.

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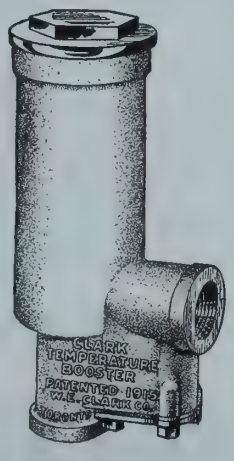
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SANITARY ENGINEER

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Continued from last issue.

The mill building is 700 feet long. The main bay is 60 feet wide, and the side bays 29 feet and 20 feet wide respectively. The building is of brick and steel construction with steel roof trusses and monitor roof. The building is lofty, the distance to the overhead crane tracks being 20 feet. A 20-ton Shaw electric traveling crane runs from end to end of the building. At one corner is located a machine shop in which is installed a lathe for turning rolls, and a grinding machine for sharpening the knives for the squaring shear. The pair furnaces are of the combination type for sheet mill work, while the mill train is situated near the furnaces, the motor for driving the mill train being in a separate room built in the main building.

The annealing furnaces at the other end of the building are located in one of the side bays and on the opposite bay is the warehouse. The warehouse is a brick building, steam heated, adjoining the mill building and is 25 feet wide by 100 feet long. The mill offices, lavatories, and shower baths are a continuation of the warehouse. In addition to the 120-inch squaring shear there is another 72-inch shear for smaller and miscellaneous sizes of sheets. Near the warehouse there is a small shear for cutting out test pieces, etc.

Shearing Sheet Bars

The bars from which the sheets are made come from the mill in 30-foot lengths, 8 inches wide. The thickness of each bar varies in accordance with the gauge of sheet into which it will be rolled. The sheet bars are piled in their respective thicknesses near the shears. The bars are lifted on to a table on the approach side of the shear and pushed through the gap of the shear until it touches the stop guide on the delivery side, this guide having been previously adjusted to the desired length of crop.

When an order goes through for rolling a certain size of sheet, the proper size sheet bars are sheared and the short pieces piled. The length of these short bars is predetermined by the size of sheet. Each bar is marked with the weight per foot and a number corresponding to the gauge. The sheared bars are now called pairs and are ready for the furnaces.

Combination Sheet and Pair Furnaces

The furnaces are known as combination sheet and pair furnaces, a type now used in modern sheet mill practice. The system consists of two furnaces one behind the other. with a single combustion chamber. The rear furnace is for the bars and the front nearest the mill is for the sheets. Between the combustion chamber and the pair furnace hearth is a bridge wall, and between the pair furnace hearth and the sheet furnace hearth is a second bridge wall. The products of combustion pass from the combustion chamber over the bridge wall

after heating the bars, pass over the second bridge wall and serve to heat the sheets in the sheet furnace. The combination furnaces are coal fired and maintained at a temperature ranging from 1,200 to 1,300 degrees Fahr. The bars are fed to the furnace by hand and the sheets or pairs are handled in the same manner.

Arrangement of Rolls

The mill train is two high and has six stands of rolls, four stands being for hot rolling and two stands for cold rolling. Of the hot rolls three stands only are at present in operation, one in the centre for roughing and one on each side for finishing. The breaking down or roughing rolls are 44 inch and the finishing rolls 36 inch. The two stands of cold rolls are 40 inch and 42 inch respectively. The mill train is driven by means of a 650 h.p. Westinghouse a. c. motor through rope drive, the fly-wheel being of large diameter and heavy. The rope drive is at the end of the mill train and provision has been made for installing another mill when necessary.

Rolling Sheets or Pairs

The bars having been sheared into suitable lengths are heated in the back end of the combination pair furnace. After they are heated to the required temperature they are taken out of the furnace by means of tongs, two at a time, the heater throwing them to the roller. The roller takes first one bar and then the other, passing them through the roughing or breaking down rolls two or three times to the catcher on the opposite side of the stand, who returns them over the top roll, using its direction of rotation to assist in this operation. After two or three passes in the finishing mill the roller places one of the bars on the top of the other and they are given as many passes as the heat will allow.

As the sheets cannot be rolled thin enough in two thicknesses except in the heavier gauges, they must now be doubled. This is accomplished by taking one end of the sheet and doubling it over another and taking it to the doubling machine. The doubling machine consists of a vertical plunger press which closes down the sheets, one on the other. When rolling the lighter gauges of sheets, the bars are put together in threes, fours or fives. After doubling, the result is a pack of four sheets but practically cold. The pack is now put into the front or sheet furnace and reheated. After being heated to the correct temperature the pack is again carried to the roller and repassed through the finishing rolls several times until the desired thinness is obtained. The roller knows when to stop rolling by gauging the length and width of the sheet. The pack does not weld together because the top friction roll runs slower than the positively-driven bottom roll. As in the case of the shearer, the roller receives instructions as to the size of sheets to be rolled on a certain rolling so that the various gauges will not get mixed up. The mill is in continuous operation, the crew of eleven men working right through for the eight hours' shift.

The pack of sheets, four or more in thickness, is now carried over to the squaring shear to be sheared to the size called for in the order. The squaring shear has a 120-inch knife. The pack is now opened that is separated into individual sheets. If the rolling has been done at a proper heat this is a matter of little difficulty, but occasionally they stick together and have to be separated by means of a blunt knife. After the pack has been opened the sheets are inspected. The sheets are then piled ac-



SHEET ANNEALING FURNACES.
SHEET BARS AND REAR VIEW OF FURNACES.

COMBINATION SHEET AND PAIR FURNACES.
WAREHOUSE SHOWING SHEETS BUNDLED FOR SHIPPING.

to the hearth of the pair furnace, and, cording to their respective gauges.

Cold Rolling Process

The usual practice at this mill is to give the sheets one pass in the cold rolls before annealing. Sometimes this operation is reversed. The process of cold rolling consists of passing the sheet through a pair of rolls exactly similar to the hot rolls, but without reheating the sheet. The cold rolling flattens out the sheet and removes burrs or fins on its edges caused by the shear knives. When the sheets are annealed before cold rolling, the rolling accomplishes the above and in addition closes the pores of the sheet, resulting from the annealing treatment. It also gives the sheet a clearer and brighter finish which is desirable for some classes of work. Sheets required for galvanizing are cold rolled before being annealed. Before being galvanized the sheets are pickled, a process which cleans the sheet and removes the scale, etc., thus a bright finish at the mill is unnecessary.

Annealing the Sheets

After the sheets have been rolled they are hard and must be annealed before they can be usd commercially. The sheets are taken from the piles near the mill, placed in bundles on a cradle and carried by the overhead travelling crane to the annealing furnaces at the other end of the mill building. Annealing is an important operation as the sheet must be sufficiently soft to stand working up.

At the present time there are three double annealing furnaces, but provision has been made for as many more. The furnaces are of brick and are coal fired, being closed at one end and having two doors at the other. The process used ot this mill is known as box- annealing, the sheets being contained in pots while in the furnace. The annealing pots are made of cast iron and will hold about 12 tons each. The sheets are laid on the bottom of the pot, called the pan, and piled up neatly, flat. The cover is then placed over the pile of sheets and secured to the pan, the bottom being sealed with sand to keep the air out. It is important to have as little air as possible in the pot. The pot is now lifted by the overhead crane, laid on cast iron balls and pushed into the furnace. The floor of the furnace has tracks upon which the balls run.

When the furnace is charged, the heat is applied until the whole mass, both pots and sheets, is red hot. The fire is then reduced, but the sheets are allowed to remain in the furnace a few hours longer to partially cool, at the end of which time the fire is banked. The time occupied in this operation is about 24 hours firing and 15 hours partially cooling or soaking. The charge is now withdrawn and the annealed sheets are allowed to stand for about 24 hours in the pots, after which the covers are removed and the sheets allowed to stand until cold enough to handle. The sheets are then removed from the pan and laid on the floor to finish cooling. If they are to be shipped as black close annealed they are ready for final inspection and the warehouse. If they require cold rolling they are carried back to the cold rolls at the other end of the building. The extreme heat in the annealing furnaces ranges from 1,300 to 1,500 degrees Fahr., this temperature being maintained for about three hours.

The final operations which consist of marking and bundling are performed in the warehouse which it will be remembered comprises one bay of the main building. When the sheets are taken from the cooling floor they are weighed on factory scales in the warehouse and laid in piles according to size and gauge. To facilitate handling the sheets are made up in bundles, each bundle weighing about 150 pounds. Each bundle is marked, giving the size, gauge and weight per foot, the company's trade mark is also stencilled on each bundle. The trade mark is the word "Steico" on a maple leaf. For some orders the sheets are packed in cars and shipped without being bundled. Some orders call for the sheets being oiled before shipment, the oiling being done in the warehouse. The company manufactures tack plate, which is made by the same process as black sheets but is not annealed.

Quality and Service

The operations involved in the manufacture of black steel sheets have now been followed from the raw materials to the finished product. The lay mind would hardly appreciate the amount of work and skill involved in the production of sheets or the great care that has to be exercised in every detail of their manufacture. Quality counts, and this can only be obtained by careful and systematic adherence to details in the various processes. Efficiency in operation is also a vital necessity if the proposition is to be a success financially. Judging from appearances at the plant the efficiency factor is high and consequently the results are in proportion. The consuming public in Canada will better appreciate the value of having a full supply of sheets available when normal conditions prevail and the company is in a better position to satisfy all requirements. As in other industries, the war is interfering with manufacturing operations to the extent that only a certain tonnage of steel can be allocated to the manufacture of sheets. In the sheet mill provision has been made for duplicating the existing plant, which will be done when the demand calls for larger production.

NEW BY-LAW REGARDING WATER CLOSETS

The M. O. H. for Chatham recommended that the Board ask the council to pass a by-law making it compulsory to have flush closets in all parts of the city where water and sewer service is procurable. He said flies were the cause of trouble where there were open closets, of which there are a few in the city. He also thought it might be well to have an inspector go up the river and see whether there are any places where there are cases of typhoid fever or intestinal trouble and if wash water or other water is being allowed to go into the river.

Chairman Cowan called attention to the fact that fishing has been going on and boys have been swimming very close to points where sewers empty into the river.

A sample of chlorine has been sent away for test to see if it is up to standard.

Chairman Cowan said that Dr. McNally said closets should be cleaned and inspected every week. Dr. McRitchie said the bylaw only called for cleaning out by May 1st.

The chairman said there was a closet on the water works property which Dr. McNally stated he had asked should be attended to, but that ten days later, on his return, nothing had been done. He said the attention of the sanitary inspector had been called to the situation.

It was pointed out that a flush closet could not be used but that a sanitary closet, such as used at the Isolation Hospital, could be used.

Dr. Bray and Mayor Clements moved that all outdoor closets be ordered cleaned at once owing to health conditions, and the sanitary officer see that they all are also treated with chloride of lime.

CORK AS A HEAT INSULATOR

Among the virtues of cork is its low conductibility of heat, and a method has recently been suggested by which this property may be made available without undue expense. This consists of a process by which old corks or waste scraps and cuttings may be agglomerated into a solid sheet which can be used as in insulating bottles, fireless cookers, etc.

According to the "French Review of Industrial Chemistry," such scraps are first swelled by cooking for several hours in boiling water or in steam and are then agglomerated after being dried by dissolving them in hot nitrocellulose, or else under pressure in a vacuum, in which case the solvent (alcohol, ether or acetone) is afterwards evaporated.

The resultant sheets or molded articles can then be impregnated with oils or with a solution of rubber. Another way of preparing cork for this use is to powder it and then mix it with plaster, dextrine, and a little water. The paste thus formed hardens in air and can be used as a coating for walls or for receptacles whose contents are to be kept either hot or cold. It can be made more resistant by uniting one part of lime with six parts of plaster, either by tempering them together or by tempering the plaster with lime water. This last mortar can be used to make bricks, tiles, panels, etc. After being made they are soaked in a concentrated solution of sulphate of iron or zinc, which hardens them.



FACTORY SANITATION

Sanitary conveniences in a factory or workshop are becoming a very important factor of efficiency.

By "Thomas Stansfield"
Sanitary Engineer

This and all the other illustrations of bad sanitation shown are of actual conditios as they exist all over the Dominion. Every filthy hole like this is a prospective job for some live sanitary engineer. The owners know no better, they need to be shown.

Article II.

ONE very important point to be observed in the sanitary conveniences of a factory or plant is that they should be kept scrupulously clean. The fact of their being so kept will exert a more powerful influence in inducing the men to use them than any other consideration. There should be an ample supply of separate towels, not the old unsanitary roller towel but a separate towel for each individual. The writer at one time was in the employ of a large concern where every employee was identified by a number. Each one was furnished with a key bearing his number; this key opened a separate locker, in which was a small tin box containing a clean towel, box of hand soap and regular toilet soap. As each employee left the plant the key was handed back to the doorkeeper, and on his return was again handed to him. The night watchman and caretakers had one master key to open the lockers, and a clean towel, soap, etc., when needed, were furnished to each workman. In many factories and workshops the grouping of fixtures has not proved as satisfactory as at first anticipated, first cost having been given too much prominence. The sanitary engineer who has been asked to lay out the equipment no doubt has had in mind the installation of as few soil pipe stacks as possible, and by grouping the fixtures so as to utilize the stack for several wash rooms, has thought it a saving on first cost. He has, however, overlooked the fact that a great deal of time may be lost by the employees using these toilet rooms on account of their having to walk too great a distance from their work to reach the lavatories.

Walls and Floors Non-Absorbent

In factories and workshops which are such as to cause the employees to perspire, or even where the body becomes dust laden, and where men bathe, wash and change sweat-soaked clothes, the walls and floors and fixtures of such wash rooms should be of some non-absorbent material, and the ventilation should be of the very best. Racks of steam pipes for drying the working clothes over night are advisable; and the drying room must have a good circulation of air to carry off the moisture, odor and dust.

The number of different kinds of fixtures that will be required in a manufacturing plant is an important point, as too few will very often prove unsatisfactory, and in case the water closets and urinals are too few much time will be lost waiting for turns. In the wash room. there should be allowed say one wash basin for every ten persons em-



Bathroom for women in a Dayton, Ohio factory. Suggestive of all the comfort cleanliness and convenience of a bathroom in the home. Can self respecting capable workpeople be blamed for preferring such accommodations to such as are shown in previous articles?

ployed who would have access to the washroom, and the same where showers would be provided, ten to each shower bath. W. c. accommodation could be provided on a basis of 1 w. c. to 15 persons, and no factory or office building should be allowed to exist these days that does not provide such necessities for both sexes.

Water Closets and Urinals

When we have to consider closets and urinals, we have a little different condition than in the wash room, simply because closets and urinals are oftener used in the employer's time and it is necessary to so scatter them about different parts of the plant, so as to result in the least possible loss of time going to and fro.

In ordinary factory or office buildings of small size, water closets and urinals fixtures grouped on each floor so as to discharge into one common soil pipe stack would be alright. But with large factories, however, which spread over a large area, besides the water closet and urinals grouped in the washroom, others should be provided at convenient places throughout the works. In addition there should be a separate toilet for the office staff and of course separate accommodation for women, where women are employed.

Type of Water Closet

Only the strongest and most modern type of water closet should be used for factory work. The use and abuse these fixtures receive has proved that only the very best quality and strongest materials will withstand the hard usage expected of them. Syphon action closets which contain a large body of water to submerge and deodorize the contents, along with a small fouling surface are best for factory use, and all toilet rooms should be well ventilated either through the closet bowl itself or by means of registers to keep the atmosphere from becoming heavy and obnoxious from the constant use of the fixtures. Many a person has refrained from using a w. c. when nature required that they should simply because of the unsanitary odors as well as filthy state of those fixtures. Such persons cannot possibly become as efficient, and therefore as great an asset to a concern, but rather the very reverse.



Part of the toilet accommodations in plant employing 3,500 persons. Such insanitary appliances are costing the company thousands of dollars per year.

Perfectly non-absorbent, light, well ventilated and light-colored w. c. compartments are not only easier to keep clean and cost less for upkeep, but are less liable to be misused or otherwise damaged than are dirty fixtures situated in dark, poorly lighted and badly ventilated compartments located in dark, out-of-sight corners. Good light, clear atmosphere, and cleanly-kept sanitary conveniences will prove to be an economic factor, and persons using such fixtures will assist materially in preventing damage and misuse of the accommodations provided by the employer, knowing full well that clean sanitary surroundings are very essential to the general health of every employee in the establishmnt.

There is another very important matter which is more constructional than otherwise, and that is that proper provisions should be made to overcome vibration, which is liable to result in damage to fixtures of all kinds, particularly those situated on the upper floors of factories where shafting and heavy pulleys are used. The joints of soil pipes and w. c. floor flange joints are apt to cause a lot of trouble.

Flexible lead closet bends and metal to metal closet floor flanges should be procured which will ensure a permanent tight joint, in spite of soil pipe stack vibration, and as far as possible the soil pipe stack should be so installed as to be clear of the general building structure. The stack should be built upon a good firm foundation independent of the building, particularly when the building is a tall one and is subject to extreme climatic conditions.

Ventilation of W. C. Compartments

Wherever a number of water closets and urinals are grouped together, in order to keep the rooms free from odor, and particularly in cold weather,when the windows of such rooms need to be kept closed, it is necessary to provide some special and positive mechanical ventilation, because of the fact that natural ventilation due to the difference in weight of air in the vent stacks and in the rooms can not be depended upon, and unless such positive ventilation is provided the foul odors will no doubt permeate into the work shops. or, where

Continued on page 30



Shower baths in a Pittsburgh plant. Showing the details of the shower room with overhead nozzles, supplied with water through mixing chambers to prevent scalding.

Building Operations for July

Building Operations in Canada Ahead For the Month of July to the Extent of Over One and One-half Million Dollars—Sixty American Cities Show Drop of 35 Per Cent. in 1917

Returns received from 25 eastern and 11 western cities and tabulated below, show a very substantial increase in building operations during the month of July, 1918, as compared with July, 1917. The 25 eastern cities report a gain of over a million dollars for the month, the total coming close to five million dollars. Western cities, with permits of $903,435, enjoyed an increase of $473,903, which proportionately is even better than the showing made by eastern cities.

July's favorable results have had a good effect on the total for the year to date, which, for eastern and western cities combined, approximate $22,500,00, or $2,300,000 better than for the corresponding period of 1917. The bulk of this gain has been made by the eleven western cities reporting, which it will be noted have enjoyed an increase of $1,855,512. Eastern cities, on the other hand, while recording total permits of $17,308,063 for the seven months are only $450,614 ahead of last year.

Ottawa's Big Gain

Of the 25 eastern cities in the list, 13 report gains and 11 losses. Were it not for the big increase of over a million made by the Capital, the month's showing, however, would not have been as favorable. Included in Ottawa's total of $1,610,830 is a large figure for a new government building. Counteracting Ottawa's gain is a drop of nearly a million in the case of Port Arthur, where permits for July, 1918 only amounted to $9,503 as compared with $925,470 in July, 1917. The latter figure presumably included permit for the Port Arthur Pulp & Paper Company's big plant.

Halifax with permits of $388,158 reflects the reconstruction work now in progress in that city. Toronto with a gain of $242,274 shows steady progress in building. Other satisfactory gains have been made as will be noted by a study of the table, by Brantford, Fort William and Welland in Ontario and by Westmount in Quebec. Montreal, with only $610,045, fell back by $267,150, and Quebec was also behind by $212,081. Another serious decline was experienced by Windsor where permits receded from $237,340 to $78,-610, a loss of $158,730.

Ottawa is well in the lead for the year to date, with a gain of $1,341,414. Toronto, while issuing a greater volume of permits, viz., $4,835,293, has a gain of $747,511. The Halifax gain is $841,449, permits for the seven months totalling $1,363,350.

Western Cities' Gain

Of the eleven western cities reporting, all but three have had gains. Winnipeg, with $227,150 in July, 1918, is ahead by $63,100 of July, 1917. Edmonton, with $150,950, has an increase of $107,250. All four Saskatchewan cities,—Regina, Saskatoon, Moose Jaw and Prince Albert,—had gains, while Vancouver was ahead by $104,-553.

For the seven months almost equally satisfactory results are shown. Winnipeg's permits, while less, amounted in the aggregate to $1,365,-550. Calgary issued $858,800, a gain of $615,600. The four Saskatchewan cities all enjoyed gains. Vancouver, with permits of $798,008, was ahead by $446,518.

Taken all in all, the July showing and the figures for the year to date are very favorable and indicate that there has been a substantial improvement in building conditions.

BUILDING DECREASED

Sixty American Cities Showed Drop of 35 per Cent. in 1917

Building operations in sixty selected cities of the United States decreased 35 per cent. in value in 1917, according to the United States Geological Survey. Last year 199,738 permits were issued, involving a cost of $584,-193,378, as compared with 269,782 permits, or $899,684,512, in 1916. Building operations in New York cost $90,-221,357; in Chicago, $49,167,990; in Detroit, $39,666,800; in Philadelphia, $33,050,220; in Cleveland, $30,483,750.

Of the sixty cities selected forty-eight showed decrease and twelve showed increase. The decrease in Greater New York was $109,010,819, or 55 per cent.; in Chicago, $63,667,-160, or 56 per cent.; in Detroit, $11,-

(Continued on page 22)

BUILDING PERMITS FOR THE MONTH OF JULY

	July, 1918	July, 1917	Change	7 mos., 1918	7 mos., 1917	Change
Eastern Cities						
MARITIMES—						
Halifax	$ 388,158	$ 56,840	+ $ 331,318	$1,363,350	$ 521,901	+ $841,449
St. John	86,998	7,100	+ 79,898	331,723	474,250	— 142,527
Sydney	31,494	39,383	— 7,889	225,884	174,014	+ 51,874
QUEBEC—						
Montreal	$ 610,045	$ 877,195	— $ 267,150	$2,649,610	$3,343,854	— $694,244
Quebec	236,875	448,956	— 212,081	724,829	1,271,592	— 546,763
Westmount	105,850	4,150	+ 101,700	191,216	83,541	+ 107,675
Lachine	46,225	6,310	+ 39,915	218,570	195,843	+ 22,727
ONTARIO—						
Brantford	$ 105,045	$ 7,425	+ $ 97,620	$ 392,105	$ 73,220	+ $318,885
Chatham	19,150	29,727	— 10,577	105,260	216,172	— 110,912
Ft. William	104,630	4,600	+ 100,030	451,450	364,415	+ 87,035
Galt	39,900	13,835	+ 26,065	120,435	72,725	+ 47,710
Hamilton	175,145	236,415	— 61,270	1,035,650	1,625,155	— 589,505
Kingston	67,182	10,557	+ 56,625	201,886	86,836	+ 115,050
Kitchener	54,027	11,290	+ 42,737	120,342	138,022	— 17,680
London	48,685	75,030	— 26,345	338,560	484,180	— 145,620
Ottawa	1,610,830	59,050	+ 1,551,780	2,008,706	667,292	+ 1,341,414
Peterborough	9,005	15,450	— 6,445	183,840	123,538	+ 60,302
Port Arthur	9,503	925,470	— 915,967	572,893	1,310,254	— 737,361
Stratford	4,180	20,001	— 15,821	51,465	130,655	— 79,190
St. Thomas	455	5,955	— 5,500	22,370	40,835	— 18,465
St. Catharines	41,658	57,854	— 16,196	312,440	290,929	+ 21,511
Toronto	1,004,278	762,004	+ 242,274	4,835,293	4,087,782	+ 747,511
Welland	100,545	16,540	+ 84,005	373,984	172,265	+ 201,719
Woodstock	7,750	6,277	+ 1,473	66,002	60,144	+ 5,858
Windsor	78,610	237,340	— 158,730	410,200	848,035	— 437,835
Total 25 E. Cities	$4,986,223	$3,934,754	+ $1,051,469	$17,308,063	$16,857,449	+ $450,614
Western Cities						
MANITOBA—						
Brandon	$ 13,550	$ 18,000	— $ 4,450	$ 39,441	$ 92,330	— $ 52,889
Winnipeg	227,150	164,050	+ 63,100	1,365,550	1,602,850	— 237,300
ALBERTA—						
Calgary	$ 45,000	$ 32,600	+ $ 12,400	$ 858,800	$ 243,200	+ $615,600
Edmonton	150,950	43,700	+ 107,250	291,180	169,400	+ 121,780
SASKATCHEWAN—						
Moose Jaw	$ 71,950	$ 39,025	+ $ 32,925	$ 408,480	$ 193,960	+ $214,520
Regina	53,300	17,360	+ 35,940	654,590	166,000	+ 488,590
Saskatoon	146,135	43,100	+ 103,035	488,745	353,015	+ 135,730
Prince Albert	55,510	1,610	+ 53,900	60,798	20,950	+ 39,848
BRITISH COLUMBIA—						
Vancouver	$ 132,155	$ 27,602	+ $ 104,553	$ 798,008	$ 351,490	+ $446,518
Victoria	1,875	19,635	— 17,760	166,455	56,000	+ 110,455
N. Westminster	5,860	22,850	— 16,990	36,510	63,850	— 27,340
Total 11 W. Cities	$ 903,435	$ 429,582	+ $ 473,903	$5,168,557	$3,313,045	+ $1,855,512
Gr. Tot. 36 Cities	$5,889,658	$4,364,286	+ $1,525,372	$22,476,620	$20,170,494	+ $2,306,126

SANITARY ENGINEER

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VOL. XII. SEPTEMBER No. 17

SANITARY ENGINEERS SHOULD ACT

ON another page of this issue there appears an article regarding a new by-law which is asked for by the Medical Health Officer for Chatham, Ontario.

Chatham is having more than its share of sickness just now, but is only reaping what it has sown. For many years there has been a move on foot to put a new plumbing by-law into force, but no, the council of that city are evidently more interested in the undertaking business. It is too bad that the law of the land does not require that an inquest be held in the case of every death that occurs. If there was such a law there would be some very startling facts brought out, and plumbing would receive more attention from town and city councils.

The odorless closet, the chemical closet and all such contraptions are also responsible for a lot of make-shift work. Every one of these appliances should be first passed upon by more than the ordinary person. Health departments should be made conversant as to where every one of these appliances are in use.

In the case where there is a public sewerage system and water works, the use of these appliances should not be permitted. Why should one person be allowed to become a menace to his neighbor and get away from the capital cost at the expense of becoming sick, and spreading sickness throughout the community?

Every sanitary engineer should take more than a common interest in such affairs. Not only from a safety first standpoint, which is the first consideration, but also because he would be remunerated for the services rendered by procuring more business for himself.

CO-OPERATION NECESSARY

THE members and delegates in attendance at the recent convention of the Canadian Gas Association held in Montreal last week voiced in no small measure the need for closer co-operation with the plumbing and heating trade. A representative of SANITARY ENGINEER, also in attendance, learned of many ways in which the gas companies of the various towns and cities throughout the Dominion could meet the plumbing trade in overcoming the many obstacles which are not conducive to good fellowship between the two bodies.

There were topics discussed in connection with both mechanical and selling, instances were given where large sales of gas appliances could have been made if a closer relationship had existed between gas manufacturers and the plumbing trade. But in spite of much frank criticism there seemed to be a large number in the majority who were of the opinion that the benefits would be eminently mutual if the get-together spirit existed.

SANITARY ENGINEER will be only too pleased to do all in its power to lend a hand in bringing matters forward with a view of creating a closer relationship, knowing full well that the splendid spirit of those present at the eleventh annual meeting of the Canadian Gas Association will at no far distant date result in increased business for the sanitary and heating engineer. The gas industry as a whole was never in so prosperous a condition. There are many gas appliances being sold and installed, all of which could be handled by the sanitary engineer if he were more of a merchant.

BIGGER BUSINESS BUILDING

IN the next issue of SANITARY ENGINEER an article will appear entitled "Possibilities of the Gas Industry," by G. W. Allen, Toronto. It contains quite a number of interesting items which cannot fail to prove to the progressive sanitary and heating engineer that there is big business to be procured by the sales of all manner of gas appliances. All such appliances involve the piping of residences, factory and office buildings. One trouble with many of the trade has been that they have become possessed with the idea that gas and gas appliances will soon be things of the past. But facts about gas prove that such is not, nor likely to be, the case for many, many years. In fact the contrary is more probable.

Gas appliances are only just beginning to come into their own for cooking and heating water, for domestic purposes, and in connection with gas-fired industrial appliances they have exceeded all expectations of even the gas and gas appliance manufacturer.

Be a Bigger Business Buil

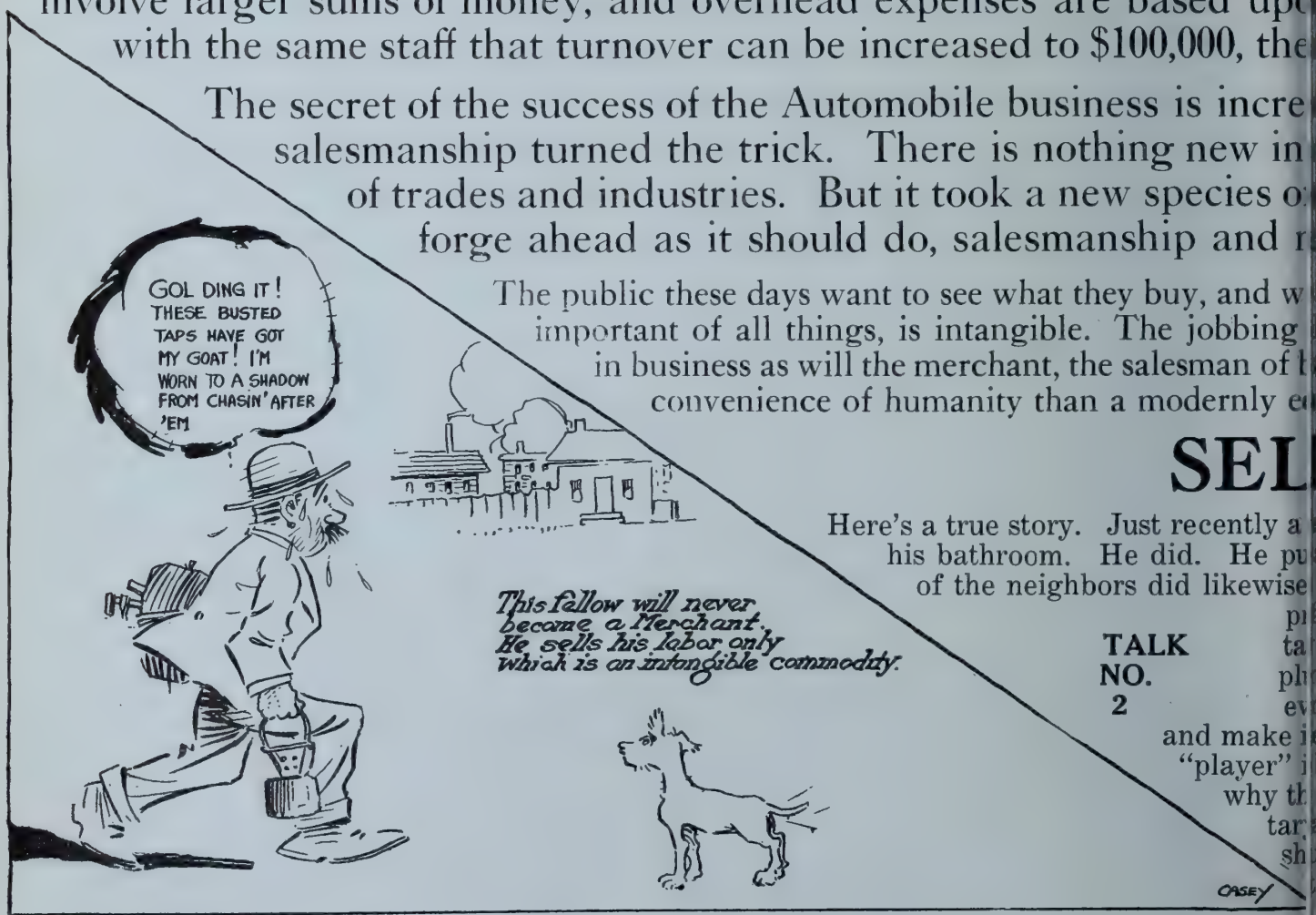
Don't Be a Tap-Washer Plumber

IN Talk Number 1 we showed that farmers owne automobiles. We proved conclusively that prospective customer for the sanitary and heati that to become a successful sanitary engineer probably not in so many words, but no doubt the sanitary and heating engineer is salesmanship.

There are altogether too many in the trade whose sole aim is to wo no fault with a jobbing business. But the cream of the profits of all involve larger sums of money, and overhead expenses are based upo with the same staff that turnover can be increased to $100,000, the

The secret of the success of the Automobile business is incre salesmanship turned the trick. There is nothing new in of trades and industries. But it took a new species o forge ahead as it should do, salesmanship and r

The public these days want to see what they buy, and w important of all things, is intangible. The jobbing in business as will the merchant, the salesman of t convenience of humanity than a modernly e

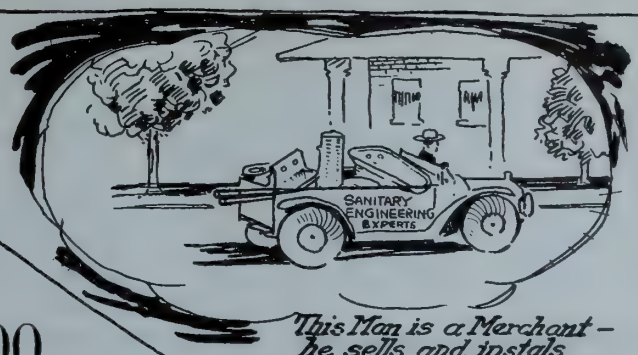


SEL

Here's a true story. Just recently a his bathroom. He did. He pu of the neighbors did likewise

TALK NO. 2

and make i "player" why th tar sh



This Man is a Merchant – he sells and instals Bathroom outfits. Such Goods are tangible – things seen with the eye



7 over 23,000
armer is a good
le. We proved also
ust become a merchant,
thing lacking in the average

ig jobbing trade, and to a certain extent there is
s based upon big sales and quick turnovers. Big sales
er. If a business has a turnover of $50,000 per year, and
l percentage is reduced by one-half.

s and increased production; but the sales were first necessary, and
It is made up of a number of mechanical applications from all kinds
nship to make it a success, and if the sanitary and heating trade is to
ising must be put into practice.

nown why. And things seen are tangible; labor, although necessary, and the most
nd fitter sells more of the intangible, and will therefore never make the same success
vatories, sinks and brass goods; and what is more valuable to the health, comfort and
chen, bathroom and laundry?

ATHROOM OUTFITS

on on a certain street was convinced by a certain sanitary engineer that he should remodel
rass goods throughout his house, bought a shower, and in less than a month quite a number
irst sales had to be made, and in that street several hundred dollars was invested, and good
from the sales of the fixtures (tangible), as well as labor involved (intangible). That sani-
ing engineer is a crack salesman, and is making money much easier than the "tap washer
he "furnace scraping fitter." It's new business and sales of the things tangible that count
d it's the duty of every sanitary engineer to make a success of his business, or else step aside
the other fellow to succeed. No one should be allowed these days to "play" at business; the
a menace to progress; he's like sand in the bearing of a machine. One of the chief reasons
merchant has taken to the sale of plumbing and heating goods is because of the fact that sani-
ng engineers have not catered to the public in a businesslike manner. The trade from now on
by the example set by other merchants, by selling the things seen (bathroom fixtures), rather
(which is not seen).

BUILDING OPERATIONS FOR JULY

Continued from page 18

401,510, or 22 per cent., and in Philadelphia, $16,269,005, or 33 per cent. Waterbury, Conn., where the building operations cost $6,562,930, showed the largest increase—$2,292,930, or 54 per cent. The other cities that showed increase were Akron, Atlanta, Chester, Denver, El Paso, Hartford, Los Angeles, New Haven, Omaha, Sioux City, and Youngstown. Various reasons are given for these changes. The principal causes of decrease were scarcity and high cost of material and labor. In some cities the cause of decrease was financial stringency. The causes of increase were local. In New Haven, for example, a great increase was caused by the erection of a large building for Yale University.

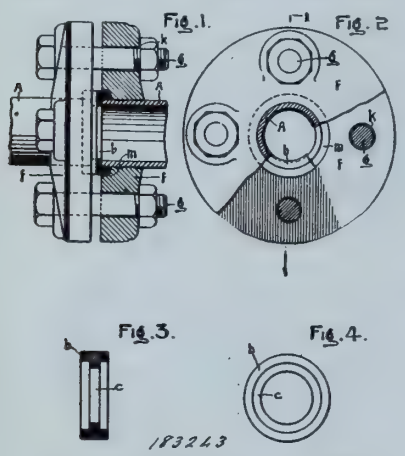
For 1917 a total of 145 cities reported operations costing $687,415,605. For 1916 practically the same cities reported operations costing $1,024,211,675, Of the 145 cities reporting for 1917, 129 stated operations by classes of structures. The total cost of the buildings erected in them was $632,694,952. The part of this amount expended on wooden buildings was $168,290,958, or 27 per cent.; on brick or hollow-tile buildings, $322,147,677, or 51 per cent.; on stone buildings, $4,589,168, or less than 1 per cent.; on concrete buildings, $66,511,300, or 11 per cent.; and on steel skeleton buildings, $58,440,361, or 9 per cent.

New Canadian Patents

No. 183,243.

Carl W. Vollmann, Montreal, Quebec, Canada, 26th March, 1918; 6 years. Filed 2nd February, 1918. Receipt No. 290,467.

Claim.—1. In a pipe coupling or joint the combination with a pair of screw-threaded pipe ends, of a relatively soft metal distortable ring having a middle flange adapted to be interposed between the pipe ends for the purpose of locating the ring in proper overlapping relation to the pipe ends, and the ends ofthe ring being adapted to overlap the screw threads, a pair of flanges upon the respective pipe ends and having central chambers adapted to receive the ends of the ring, and means for clamping the flanges together.



No. 183,243. Pipe Coupling.

2. In a pipe coupling or joint the combination with a pair of externally screw-threaded pipe ends, of a relatively soft distortable ring having an internal middle flange adapted to be interposed between the pipe ends, and the ends of the ring being adapted to overlap the screw threads, a pair of flanges screwed upon the respective pipe ends and having central chambers adapted to reecive the ends of the ring and when the said flanges are drawn together exert compressive action thereon to effect a tight joint between the flanges and the pipe ends, and means for clamping the flanges together consisting of bolts passed through the flanges, the walls of the chamber being tapered to urge the metal of the ring into the screw threads.

3. In a pipe coupling or joint the combination with a pair of screw-threaded pipe ends, of a relatively soft metal distortable ring having a middle flange adapted to be interposed between the pipe ends for the purpose of locating the ring in proper overlapping relation to the pipe ends, and the ends of the ring being adapted to overlap the screw threads, a pair of flanges upon the respective pipe ends and having central chambers with their walls inclined relatively to the outer periphery of the pipe ends and adapted to receive the ends of the ring, and means for clamping the flanges together.

No. 183,146.

William George Beatty, Fergus, Ontario, Canada, 26th March, 1918; 6 years. Filed 27th August, 1917. Receipt No. 283,701.

Claim.—1. A pump comprising a cylinder, two oppositely moving pistons therein having appropriately trapped waterways therethrough, a pump rod with which one of the pistons is connected, a U-bend arm with which the other piston is connected, and a link for the U-bend arm, in combination with a fulcrumed pump handle connected on one side of the fulcrum with the pump rod and on the other side with the link to simultaneously cause the pistons to move in opposite directions.

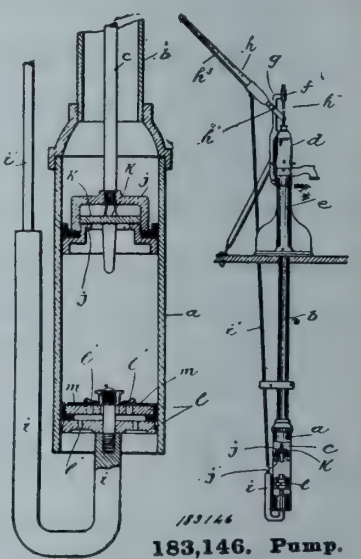
2. A pump comprising a cylinder, two oppositely moving pistons therein having appropriately valved waterways, a fulcrumed pump handle, and appropriate connections between the pistons and the pump handle, one of said connections extending through the pump standard and the other of said connections being exteriorly of the pump, to approach each other during one stroke of the pump handle and move away from each other during the opposite stroke.

No. 182,280.

The Bawden Pump Company, Limited, assignee of Thomas Marsden Jones, Toronto, Ontario, Canada, 12th February, 1918; 6 years. Filed 7th December, 1917. Receipt No. 288,433.

Claim.—1. In a centrifugal pump, the combination with the casing thereof, made in two sections, each end of said casing being interiorly provided with an annular flanged groove, non-rotating removable members constructed to interlock with said annular grooves formed in said casing, and spaced apart, the impeller shaft, and an impeller removably mounted within said casing on said shaft and positioned to co-act with said removable members.

2. In a centrifugal pump, the combination with the casing thereof made in two sections, each end of said casing being integrily provided with an annular flanged groove, non-rotating removable members constructed to interlock with said



183,146. Pump.

annular grooves formed in the ends of said casing, and spaced apart, the impeller shaft, and an impeller provided with open type blades removably mounted within said casing on said shaft and positioned to co-act with said removable members in such a manner that the sides of the said blades will have clearance therewith.

3. In a centrifugal pump, the combination with the casing thereof made in two sections, each end of said casing being integrally provided with an annular flanged groove, non-rotating, removable wearing plates constructed to interlock with said annular grooves and spaced

(Continued on page 30)

Gas By-law and Inspection of Piping

A Paper Read at the Eleventh Annual Convention of the Canadian Gas Association, Held in Montreal Aug. 22-23, 1918—Every Sanitary Engineer Should be Interested in This Paper

By E. H. CAUGHELL, Manager of the Gas & Electric Dept., St. Thomas, Ontario.

IT may be assumed that all gas companies, or municipally owned gas departments have certain rules and regulations respecting the installation of gas piping and the various gas appliances. The enforcement of these rules and regulations, however, is often extremely difficult, more particularly in the case of municipal control. It would therefore seem desirable that a definite code be adopted and administered by a central organization which could be assisted or backed up by Federal authority.

Attempts to standardize methods without proper authority and without any attendant penalty for their violation is a waste of time and energy. Doubtless the lack of standard methods is largely responsible for the antagonism which unfortunately often exists between the plumbers and the gas company. In the case of smaller companies where no inspector is regularly employed it often happens that the company's representative will demur at the connecting up of a service where he is well aware that the house piping has been badly or improperly installed. However, he has no alternative and will very likely be met with the argument that business competition had forced the plumber's price to a point where he could not afford to use heavier than half-inch pipe, although knowing from the anticipated use that nothing smaller than ¾-inch would render satisfactory service. The adoption of standard installation would at once overcome such difficulties, and result in better service to the consumer, and happiness in the long suffering complaint department.

So far as we are aware there has never been any concerted action on the part of Canadian gas companies for the adoption of standard practice in gas piping.

We believe, however, that the U. S. Bureau of Standards have started the movement by sending out a questionaire to various gas engineers throughout the United States with a view to securing data that will enable the bureau to formulate a code based on the composite opinions of these experts. This code may then be adopted by all gas companies large and small, and will unquestionably prove of incalculable value to the gas industry in general.

It is only common justice that the gas company should have the right to demand that gas piping be installed in such a manner as to establish the greatest factor of safety and efficiency. On the other hand the consumer should not be compelled to incur needless expense which will eventually accrue to the benefit of the company. However, as the company will always have certain responsibility in connection with the installation so long as service is being rendered and naturally possess technical knowledge with respect to the matter, it would seem reasonable that the company should be the one to designate the size and manner of such installation.

Rules and regulations to be effective should be reasonable and not inconsistent with good business methods. In the adoption of a standard code, therefore, great care should be exercised to eliminate any requirements that are not practised by the gas company's own fitters, but as correct methods are always consistent, there should be no difficulty in adopting a standard to the mutual advantage of the consumer and the company. In this connection it may be said that safety methods should be considered primarily as for the protection and benefit of the consumer, although the purpose and intent of regulations should be for good service, safety, and general efficiency, which naturally will work out to the advantage of both consumer and company.

It may be argued that the company or department have matters entirely in their own hands, and may refuse to give service unless the piping has been properly installed and approved. Theoretically this sounds all right, but in the case of municipal control at any rate it is not always workable. Practically it will work out something like this: Mr. Blank, an influential citizen and heavy ratepayer, owns several houses, and one of his most desirable tenants has threatened to vacate unless gas piping is installed in the premises. Fearing that he may lose his tenant he consents, and without consultation with the gas department he goes to a plumber and instructs him to figure on piping the house for gas, at the same time reminding him that he wishes the work done as cheaply as possible. Having this in mind, the plumber learns in a general way from the tenant about how many openings will be required, and proceeds to figure on the work. The price being satisfactory he secures the contract, and when the gas department finally receives an application for the gas service and a man is despatched to set the meter, he will probably find:

1. That the riser is so located as to necessitate setting the meter in a most inconvenient place, and probably exposed to frost or dampness.

2. That the piping throughout is too small and entirely inadequate to give anything like a satisfactory service.

3. That the cellar lines are not properly supported, and will eventually develop valleys.

If the gas department refuses to introduce the gas under such conditions, the influential citizen appeals to the civic representative, and here's where the latter gets busy. Having been elected by the people to administer their affairs, he and his colleagues are virtually in control of the public utility, and issue instructions to the superintendent to carry out the wishes of the influential citizen. The result will be just what might be expected by any practical gas man. All this may be avoided by the adoption and rigid enforcement of specific rules and regulations governing such matters. In the first place, it should be made necessary and compulsory for the prospective gas consumer to obtain a permit for piping the house from a properly authorized inspector or official. Plumbing contractors should be furnished with copies of standardized rules, and when the work is finished, an inspection certificate issued to the gas company or department, authorizing the connection of the service. Penalties should be prescribed for the violation of any of the standard methods. There are many details to be worked out in the formulation of an ideal code. The establishment of an inspection department would doubtless arouse argument as to who should be responsible for the payment of inspectors' fees. These matters mighe be left in the hands of a committee of practical gas men for recommendation to, and final adoption by this association.

In a general way a standard code should embrace the following items:

1. Specifications for piping. This should include a table showing number of feet of pipe permitted, determined from number of outlets and capacity of pipe.
2. Size of pipe.
3. Location of wall entrances.
4. Minimum sizes for main runs.
5. Location of risers and relative position to meter.
6. Pressure test.
7. Appliance connections.

Doubtless other important requirements would suggest themselves in the working out of a universal standard, but in a general way, the above rules cover the most important points, and the Canadian Gas Association would seem to be the natural medium through which to bring about desired results. In making these suggestions, the writer has in mind the conditions as they exist under municipal control, and it is quite possible that the scheme will not appear so strongly to the management of private corporations. Obviously, however, standard methods are desirable in all lines of endeavor, as the general operation of kindred industries is the same the world over, irrespective of the system of management. We trust that this association will take the matter under consideration with a view to formulating a plan along the lines suggested, which we feel assured would prove mutually advantageous to the gas industry and the user of the product.

The Specialized Newspapers

Why the Daily Press Does Not Publish the Important Information Bearing on Conduct of the War is Explained by Col. Maclean—The Business and Technical Newspapers Have Made Careful Study of Conditions

LIEUT.-COL. John Bayne Maclean, president of the MacLean Publishing Co., has been writing for MACLEAN'S MAGAZINE a strong series of articles on the war which have without doubt been creating more interest among Canadians than any other articles published. They give a clear insight into conditions under which we are working and go into a great many points untouched by the daily newspapers. In the July issue of MACLEAN'S Col. Maclean, deals with the influence of the specialized business paper and explains why it is in position to give its readers definite, practical information that the daily press either has not access to or not the specialized writers to present it properly and intelligently. His article says:

"The question has been asked many times how it is that the big daily newspapers have not had access to and thus have not published the long series of important and conclusive information bearing on the war and political problems that have appeared in our columns. Do we know more than the dailies? Generally, no; on many matters, yes.

"The writers on the dailies are far better informed on a greater variety of current topics of general interest than we of the specialized press, but we have the advantage in our much more thorough knowledge of a number of particular topics.

"The dailies are the general practitioners of the newspaper profession, while the financial, business, technical, agricultural and other class newspapers are the specialists. In fact the smaller dailies and rural weeklies are to some extent specialized also, in that they devote the greater part of their space to local problems. Many weeklies now give no space to national topics excepting where they affect local conditions. One rural editor told me that when Queen Victoria died not a line appeared in his paper, but that week he devoted a column obituary to an old resident in a back township.

"Specialized newspapers are a development of the last half century, to fill a demand for more complete news on certain important topics than the daily papers can afford to procure or give space to. Many of the greatest class papers are little known outside of their own field; but there, if they are well edited, they are very powerful and have built up such a reputation as accurate, honest, fearless authorities that the good will of any one of half a dozen leaders is valued at more than the good will of combined dailies of Toronto. The *Iron Age*, for example, the weekly authority in the metal manufacturing industry, is valued to-day at over $3,000,000.

"Some years ago the city of Toronto paid the editor of another class paper $10,000 for his advice on an engineering problem which he prepared in his spare time. You can estimate the value of his regular weekly services to the permanent readers of his paper. Notwithstanding this there are some newspaper editors in Toronto who are still so far behind progress that they want such papers suppressed that they may have a monopoly of news selling. The manipulation of the Associated Press in the interests of inefficiency shows what would happen if they had their way.

"Many of the specialists on the class papers are recruited from the best writers on the daily press, and there may be several of them, highly paid, studying, investigating, travelling at great expense in the interest of papers that have not more than 2,000 to 3,000 subscribers. But these subscribers may be the most important men in the country, having invested in that particular field tens of millions in money and employing or depending upon them hundreds of thousands of Canadians; and who depend, for their most important news, upon these specialized newspapers.

"There is another great difference between the work and training of the general and the specialized writer. The chief aim of the former is to seek out the current, novel and sensational, and to write and to display it in the way best calculated to attract attention and promote the street or newstand sales of his paper. He must be most careful to please his readers by expressing no opinions or by appealing to their prejudices. Otherwise they will buy a competitor's paper next day. There are, of course, some outstanding exceptions where a paper is so much stronger than others in its field that it can afford to be, and is, independent.

"The specialists must not only follow their own particular lines and keep in touch with all the topics handled by the general writers as they affect their readers, but must dig deeper down. The general writer's work is done when he records happenings, sometimes inaccurately and unfairly for lack of time. The writers in the business papers must also study the immediate and future effects on the investors and men and women employed in his particular industry and indirectly on the whole country.

"Again, the general writers cover primarily the official world, and the chance occurrences that originate there, from the police and fire halls, courts, municipal buildings, small ward politicians, public meetings, conventions and on up to the departmental officials and professional politicians and wire pullers at the provincial and national capitals. We do not pay as generously as we should, and there is no doubt we have many able men in our public service and life who could earn more elsewhere, but who are enthusiastically and conscientiously devoted to their work. But a great many are mediocre in ability and regard their jobs as the life pensions for party services. Yet these are the men who, to a great extent, inform or misinform, and inspire the general writers, the Associated Press and special correspondents.

"The special writers come in contact with very few of this class. They have to handle the big problems, and their information must come from the highest sources. Their daily life is spent among the leaders in finance, industry, business, agriculture and labor. If it is a question affecting business they must see the Cabinet Minister in whose department it is, or the Prime Minister himself. And usually he is just as anxious to see the specialist as the latter is to see him, for often he knows more about the matter and the effect it may have than does the Minister.. If it is a big railroad problem the presidents must always be seen. An important financial matter calls for an interview with the ablest bankers or other specialists. All for information, not inspiration or advice. The class newspaper specialists must see other sides to a question and act on what is in the best interests of all—the general public as well. Also they must be accurate whether it pleases their readers or not.

"In the evidence which came out in the correspondence seized by the Government in the grocery and in the metal trades combines investigations some years ago many letters were made public showing the strenuous, but unsuccessful, efforts that had been made by some of the big men in these powerful organizations to secure the support of *The MacLean Publishing Company's* papers to policies that we, with our broader outlook, saw would rebound, as they did rebound, upon the promoters. Two of the men who were defendants in these cases were big enough to tell me since that we were right. It is interesting to note now that for years I was accused of being in league with these combines. The publication of some of the seized correspondence and minutes showed that while our relations were friendly I had refused right along to be their organ. Our policy lost us many thousands of income in advertising, but became an asset in the increased confidence of our subscribers.

"What I have written is in explanation, not condemnation, of a condition and a system the world over. In proportion to population no country is more honestly or better served by its big dailies than is Canada. But they are liable to be misled by men seeking to gratify their own envies or prejudices. The Canadian Asso-

ciated Press as it exists to-day originated in my own office—see records Canadian Press Association—at a time when British news came to us through New York, where it was sometimes doctored to meet the prejudices of certain U. S. readers to such an extent that it was developing a misunderstanding of the motherland in Canada.

"But the C. A. P. can even now be unfairly manipulated. When Colonel Bruce and his committee of Canadian officers on Sir Sam Hughes' instructions investigated our medical organization he uncovered fearful conditions due to inefficiency, favoritism, neglect, under which our men suffered and millions of Canadian money was wasted. Sir Sam's enemies and the men responsible for this state of affairs brought influence to bear, and an Imperial officer, Sir William Babtie, was requested to pass on the Bruce report, which he did in very unfavorable terms. Influential in the Associated Press were certain Canadian newspapers which were fanatical in their dislike of Hughes, and the Babtie report was played up right across Canada. Then a peculiar thing happened. The report of the committee investigating the Mesopotamia affair showed that Babtie was the man chiefly responsible for the medical arrangements that will go down as one of the most disgraceful occurrences in our military history. Yet the Canadian Associated Press in dealing with this gave all the other names, but carefully omitted any reference to Babtie and the severe exposure of his incompetence. Not a word of this got out in Canada until we published the real facts in *The Financial Post*, taken from the original reports in our own office. The London papers of that date were then referred to and it was found that none of them suppressed Babtie's name, which suggested conclusively that certain interests behind the C. A. P. had intentionally omitted it. It is needless to say that such tactics created intense indignation among the more reputable dailies. It was brought up at a meeting of the C. A. P. but certain Toronto interests have so far succeeded in side-tracking a free discussion.

"The specialist in journalism leads a strenuous life. He is constantly in conflict with rival interests and he must ever be on the alert to avoid being misled. The only advice I got from my chief, when I began to specialize on finance and business, was: "All men are liars when their pockets are affected; verify everything." I have not found them so. I have seldom been misled by a big man. But small men hedge or are untruthful.

"The problems and information I have been dealing with in these columns may be new to the general writers on the daily press, but they have been more or less part of my daily life for well over thirty years. We have had to follow them for their immediate and future effect upon the business interests of the country. And I have had the additional advantage of twenty-eight years' continuous service in the Canadian militia, nearly all of it as an Adjutant or Commanding Officer. Add to it the control for many years of the *Canadian Military Gazette*, in our long fight for the Army against Headquarters inefficiency and political interference. Finally a short experience attached to an Imperial Cavalry Brigade, with Gen. French in command and Haig as one of his staff, gave me an insight into British army conditions as they are; and an increased admiration and respect for the splendid capacity of our military leaders, if given the support and opportunity our damnable politicians refused them.

"International affairs have not hitherto come within the sphere of Canadian writers, and I have had perhaps a little more experience than the average Canadian journalist. My best friends in Europe for many years were two Tory journalists, J. M. Maclean, M.P., a relative of the former Canadian Chief Justice, born in the West Indies, educated in England, lived many years in India; and Lord Glenesk, owner of the *Morning Post*. The big political problems of Empire were their constant topic of conversation and correspondence. They feared the present international developments. Premier Salisbury's inactivities and his and Balfour's surrenders to Germany and Russia in the East worried them. Lord Glenesk considered the Asquith Ministry a positive danger to the Empire. Writing me shortly before his death he said: "I am sure that your active intelligence and powers will be steadily worked at this crisis when the doings of our new ministry are tending to imperil so much of what you and I hold precious." He clearly saw where such a group of incompetents were leading the Empire.

"I would have been very useless, indeed, if, with all these experiences I had not gained a fair knowledge of actual conditions and come into most cordial and confidential relations with a number of the truly great British soldiers and sailors who have been doing some of the big work in this war. Some of them have not hesitated to write me frankly and fearlessly in endorsation of the policy I have been following.

"Anyone with common-sense can see there is no miracle in obtaining the information I have published, or in pleading for the changes absolutely necessary to help our army and navy to win the war. I am merely reflecting the views of our great men who are on the spot and know what they are talking or writing about. They demanded first "Pitiless Publicity," knowing that it will lead to reform and efficiency. One of the three greatest British generals, famous in this war, has written me a three-page foolscap letter full of most valuable and helpful information. In the course of his letter he said of my February article on "Why We Are Losing the War," "I THINK YOU ARE ABSOLUTELY RIGHT," etc. He then proceeds to show how the great military leaders are in accord with and want the co-operation of the business men, and how certain politicians have prevented it, as I have been contending all along. What stronger endorsation do I need than these words from such a man?

"What I cannot understand is that other writers and politicians do not see things as I do, and carry on the same campaign. It requires only ordinary common sense. Possibly Sir Harry Johnston's explanation as given in a recent article in the *University of Cambridge Magazine* when he said:

"A person who like myself is always anxious to realize the exact truth about everything, who thinks the truth more wonderful, more intricate than fiction, who believes that departure from the truth or oversight of the truth is much more due to laziness, to deficient powers of observation, than to maliciousness or direct inspiration from the Devil, is not very happy in the world of our own time so fond of illusions. Firstly, he is not liked. He finds most of those who should be his natural associates and classmates persisting in error, preferring the wrong view to the right view because a change of views is tiresome. Anyone, therefore, who tells them how to spell the name properly, how to read the text correctly, how to detect the sham or the anchronism is as objectionable as the malaria expert at the India Office or the accurate translator of Rumanian at another office. Secondly, he is not believed. He can't be right because Ruskin did not think so, because the Church has always held, etc., because the Cabinet must have been fully aware at the time. . . . Because you would not surely set yourself up against Mr. Gladstone? and you don't imagine for a moment Eir Edward Grey overlooked this, or Sir Sidney Lee forgot that, or Sir Oliver Lodge invented the other thing? In short, we are most of us disinclined to question the authority we are too busy or too idle-minded to investigate. We are a prey to that inversion of genius which is an incapacity to take pains. It is so much easier in writing and in painting to be vague and inaccurate that whole schools of art and literature have arisen under the false religion of the imagination; nay, religions themselves have been painstakingly reared on false premises and exaggeration, on dreams and guesses, on hearsay that was not verified, on anything rather than a plain statement of fact, even though that fact or that group of facts was far more wonderful to an educated mind than the silly and impossible legend or the reputed miracle could be to the untrained intelligence which so easily believed the incredible."

THE IRONY OF IT

SANITARY ENGINEER was conversing a few days ago with a master plumber in Montreal. In the course of an interesting chat a matter came up, illustrative of the sorry circumstances surrounding the "bidding" which every concern is making for work offered.

In this instance a large job of heating was planned in one of the big private institutions. The trade was given an opportunity of tendering. Among those figuring were two well-known and friendly heating engineers, and, unknown to each other, they made up their estimates. The same were mailed in the regular way. One got the job—the other didn't. And now comes the rub.

In the best of humor our good friend laughingly referred to the figures that were later made known to him by the party having the work done. "My price was figured carefully—and my bid totalled $5,998.71. My friend's price was $5,998.00—and he got the work." The writer suggested that this was a regrettable incident—a veritable "thorn in the flesh." "No, we had a great laugh over it when the facts were known—we are the best of friends."

This surely indicates the care with which master steamfitters and plumbers are figuring. 'Tis fine work and worthy of note.

Market Conditions and Tendencies

Statements Regarding the Prices and Trend of Supplies.

THE MARKETS AT A GLANCE

DECLINES from 5 to 10 cents per pound in ingot tin have been recorded during the week, following a sharp break at primary points. Some talk of fixed prices continues to go the rounds but no announcement is yet forthcoming. Supplies are very fair and though not plentiful, manufacturers are able to sustain operations. The break in tin may influence prices on solder to lower levels.

Further advances have been made in both black and galvanized sheets. Present quotations range from 25c to 50c per 100 pounds over those previously ruling. The situation in regard to deliveries of supplies from United States mills shows no improvement and jobbers' stocks are reaching the vanishing point.

Virtually all supplies now in jobbers' warehouses are held for war work of some kind and unless replacement is permitted on this basis, various war enterprises may have to suffer through scarcity of materials. It is possible shipments may be released at an early date and the function of the jobber as a cog in the successful operation of the war machine should not be overlooked.

Manufacturers turning out other than war material are finding it increasingly hard to get materials. This is shown in soil pipe and wrought iron pipe, supplies of pig iron for the former and skelp for the latter being almost unobtainable. Larger than 2-inch is now almost unobtainable in genuine wrought iron pipe and some enquiries for cast pipe have been made.

A variation in oakum has occurred in some quarters, prices going up slightly. Spelter has also advanced ½c since last issue, the scarcity of supplies developing under stimulus of improved demand bringing about this changed condition. Dealers' buying prices on stove plate and old cast iron show an advance with scarcity apparent. Other lines are in light demand. Business in finishing materials of all kinds shows improvement and is expected to be fairly brisk during the next couple of months.

TORONTO, August 29.—Further advances have been made in black and galvanized sheets ranging from 25c to 50c per 100 pounds. Tin has suffered a decline of from 5c to 10c per pound following an easier range of prices at primary points. This, it is thought, may have a tendency to bring quotations on solder to lower levels. Higher prices are being paid for stove plate and cast iron and indications are that this is hard to get. Business shows some improvement in finishing materials.

Very Firm Tone To Range Boilers

RANGE BOILERS.—New and higher prices named on galvanized sheets have provided a decidedly firm undertone to the market on range boilers. Manufacturers find it harder to secure supplies. Quotations herewith are without change:

	Standard	Extra Heavy
30-gallon range boilers	$14.00	$17.00
35-gallon	17.00	20.50
40-gallon	20.50	24.00
52-gallon	28.00	32.00
66-gallon	37.00	42.00
82-gallon	45.00	50.00
100-gallon	62.00	70.00

Enamelware Moving In Fair Quantities

ENAMELWARE.—A better movement of the various lines of enamelware is apparent, finishing work now being in progress with a consequent reflection in demand for tubs, sinks, closets and kindred lines. Prices hold firm and unchanged.

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Sinks, roll rim, 18 x 30 in., staple	16 80
Closets, oak tank and seat	24 00
Do., enamel iron or white vitro tank	26 00

Scarcity Pig Iron Affecting Soil Pipe Outfit

SOIL PIPE, FITTINGS.—The continued scarcity of pig iron for commercial demands is being reflected in a decided curtailment of production on soil pipe and fittings. The outlook for the future remains uncertain, no promise of supplies being forthcoming from the furnaces. Prices are unchanged as follows:

SOIL PIPE FITTINGS.

Medium and extra heavy soil pipe, 6-inch and under	30%
8-inch soil pipe	25%
Medium and extra heavy fittings, and under	40-40 & 2½%

C. I. PIPE FITTINGS.

Cast iron fittings	Net List
Plugs	15%
Bushings	18%
Flange unions, standard	Net List
Dart unions, ¼-inch to 2-inch	15%
Do., 2½ in. and larger	6½%
Nipples, up to 4-inch	45%
Do., 4½-inch and larger	40%
Do., running thread 4-in. and under	25%
Couplings, 4-in. and under	35%
Do., 4½ in. and larger	15%

MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittgs., Class A, lb.	.60	.75
Do., Class B., lb. net	.27	.37
Do., Class C., lb. net	.19	.27

Waste Selling Freely; Oakum Revised

WASTE, OAKUM.—Sales of waste continue along satisfactory lines and manufacturers are busy keeping up with orders. Prices remain firm and unchanged.

Oakum shows a slight revision in some quarters and prices now ruling are for best (American) $21.00-$22.00; clipper (spun) $21.00; clipper (unspun) $19.50; U. S. Navy (spun) $21.50; plumbers' (spun) $9.00-$10.50. Business is good and conditions generally satisfactory.

	Per 100 lbs.
Best American	$21 00-$22 00
Clipper, spun	- 21 00
Do., unspun	- 19 50
Plumbers', spun	9 00- 10 50

Valves Hold in Steady Position

VALVES.—A very steady market prevails in valves. Prices are very firm and unchanged from recent advances recorded. A very fair volume of business is being handled.

	Discount off list
Ground work	42
Compression work, standard	47
High grade	41
Cushion work	40
Fuller work, standard	45
High grade	38
Basin cocks, No. 0 standard	40
Nos. 1 and 2	40
Bath cocks	50
Flatway stop and waste cock, standard	50
High grade	47
Roundway stop and waste cocks, standard	50
High grade	47
Brass steam cocks, standard add 10%.	
Globe, angle and check valves, standard.	Net
Do., removable seat	Add 5%
Radiator valves, standard	10
Do., removable seat	Net List
Patent quick opening valves	30
Basin Cocks—	
No. 0 and 1, Fuller pattern	45

Globe, angle and check valves, standard, medium pressure	20
Radiator valves, standard med. pressure.	30
Radiator valves, removable seat, medium pressure	25

Wrought Iron Pipe Firm, Unchanged

WROUGHT IRON PIPE.—There is no relief apparent in the situation as it affects wrought iron pipe. Stocks continue to reach even smaller proportions as production is greatly curtailed through scarcity of materials. Prices shown herewith are unchanged.

NEW SCHEDULE OF PRICES ON WROUGHT IRON PIPE

Price List No. 36 (July 5, 1918)

	Black Per 100 feet	Galvanized Per 100 feet
Standard Buttweld		
⅛ in.	$ 6 00	$ 8 00
¼ in.	5 22	7 35
⅜ in.	5 22	7 35
½ in.	6 63	8 20
¾ in.	8 40	10 52
1 in.	12 41	15 56
1¼ in.	16 79	21 05
1½ in.	20 08	25 16
2 in.	27 01	33 86
2½ in.	43 29	54 11
3 in.	56 61	70 76
3½ in.	71 76	88 78
4 in.	85 02	105 19
Standard Lapweld		
2 in.	29 97	36 45
2½ in.	45 05	55 28
3 in.	58 91	72 29
3½ in.	73 60	91 54
4 in.	87 20	108 45
4½ in.	99 06	123 82
5 in.	115 40	144 30
6 in.	149 80	187 20
7 in.	195 20	243 95
8 L in.	205 00	256 25
8 in.	236 20	295 20
9 in.	282 90	353 25
10 L in.	262 40	328 00
10 in.	337 80	422 30

Terms 2% 30 days, approved credit. Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Shipments Boiler Tubes Reach City; Will Help

BOILER TUBES.—Shipments of boiler tubes, mostly 2-inch, have reached the local market during the week. These, it is thought, will help out the shortage existing for so long very materially, though distribution will be largely under Government supervision. Prices shown herewith are without change.

Toronto—	Per 100 feet Cold drawn	Lapweld
1 inch	$36 00	$ ....
1¼ inch	40 00	....
1½ inch	43 00	36 00
1¾ inch	43 00	36 00
2 inch	50 00	36 00
2¼ inch	53 00	38 50
2½ inch	55 00	42 00
3 inch	64 00	50 00
3¼ inch	....	58 00
3½ inch	77 00	60 00
4 inch	90 00	75 00

Price Revisions Made in Black, Galvanized Sheets

SHEETS, PLATES.—Some revisions in prices of both black and galvanized sheets have been made, advances ranging from 25c to 50c per 100 pounds. Jobbers face a period of vanishing stocks and the situation is that there is no chance of increased supplies coming to Canada. That being the case, the only thing is to make the available supplies go to the points where the most essential work is being carried on from the viewpoint of the war officials. It has been a hard matter for the Canadian allotment of steel to be sustained week by week. In fact, there have been times when there has been a falling off, and it looks as though this may be even more pronounced. The outlook today is serious in more ways than from the jobbers' standpoint. It is true that they will lose the revenue from sales if supplies do not reach them, but it is also true that to the jobbers' foresight in getting stocks belongs in a large measure the successful and continued operation of many war industries. Jobbers have worried and fretted over getting shipments through and have kept various war enterprises supplied when otherwise they would have had to shut down. Delays in allowing jobbers to replenish their depleted stocks may interfere with the war program. Prices being quoted to-day range as follows:

BLACK SHEETS—	Per 100 lbs.	
10 gauge	....	$10 30
12 gauge	....	10 00
14 gauge	$7 95	8 40
16 gauge	8 00	8 05
18-20 gauge	8 05	8 30
22-24 gauge	8 10	8 35
26 gauge	8 15	8 40
28 gauge	8 25	8 50
3-16 inch plate	10 10	10 25
¼ inch boiler plate	....	10 00

Prices shown are for full cases. An extra charge of from 25c to $1 per 100 lbs. is made for less than case lots.

GALVANIZED SHEETS—		
10¾ oz.	$10 00	$10 25-$10 50
U.S. 28	9 70	9 95- 10 20
U.S. 26	9 40	9 65- 9 90
22 and 24	9 25	9 50- 9 75
18 and 20	9 10	9 35- 9 60
16	8 95	9 20- 9 45
14	8 85	9 10- 9 35

Prices shown are for full cases. An extra charge of from 25c to $1 per 100 lbs. is made for less than case lots.

Easier Tendency in Solder; Lead Products Steady

LEAD AND ZINC PRODUCTS.—A reduction in prices of tin has brought about an easier feeling in solder. This has not yet resulted in a lowering of present quotations but that a reduction from high levels ruling to-day may come seems possible.

The market on manufactured lead products may be looked on as steady. The fact that a price has been determined upon by producers of pig lead with the sanction of the Government will serve to stabilize the market. Quotations range as follows:

Lead pipe, lb.	$0 15	$....
Lead waste pipe, lb.	0 16	....
Lead traps and bends	Net list.	
Lead wool, lb.	0 15½	0 16
Lead sheets, 3 to 3½ lbs. sq. ft., lb.		0 13¼
Lead sheets, 4 to 8 lbs., sq. ft.	0 12½	0 13

Cut sheets, ¾c lb. extra, and cut sheets to size, 1c. lb. extra.

Solder, guaranteed, lb.	0 60	0 65
Solder, strictly, lb.	0 55½	0 70
Solder, commercial, lb.	0 51	0 62
Solder, wiping, lb.	0 55	0 60
Solder, wire, lb.	0 70	0 85
Zinc sheets	....	0 26

Stove Plate, Cast Iron Higher; Hard to Get

OLD MATERIALS.—Buying prices on stove plate and old cast iron have reached higher levels, but indications are that these are very hard to get. Heavy lead pipe and heavy copper show slight revisions also. There is little acitvity apparent in any of the lines just at present. Full range of dealer's buying prices follows:

Dealers' Buying Prices		
Tea lead	$0 05¼	$....
Heavy lead pipe	....	0 08
Yellow brass	0 12	0 13
Red brass	....	0 21
Light brass	....	0 09½
Heavy zinc	0 05½	0 06
Heavy copper	0 22	0 23
Stove plate, per ton	....	25 00
Old cast iron, per ton	....	30 00

Tin Registers Decline; Spelter Up ½c lb.

INGOT METALS.—Tin has registered a decline since last issue, this furnishing the feature of the metal markets. Lead is now stabilized on agreed price of producers. Spelter is up ½c per pound and ruling with a firm undertone.

COPPER.—Little interest attaches to this market. Prices hold unchanged at 30-32c per pound, though higher levels are looked for when "price-fixing time" comes around again. Production seems equal to war demands at least, though little is being released for commercial requirements.

TIN.—A decline of from 5 to 10c per pound, making to-day's prices $1.05 to $1.15 per pound featured this metal since last issue. Supplies continue to come along sufficiently well to take care of most urgent demands.

SPELTER.—The market is now ruling with a very firm undertone and supplies continue light. Production has been curtailed and the present demand absorbs output quickly. Price has advanced ½c to 11c per pound.

LEAD.— The agreement reached among producers as to price of lead seems to carry Government approval and this has served to steady the market. Prices hold at 10½c to 11c per pound locally and supplies, though light, equal most urgent needs.

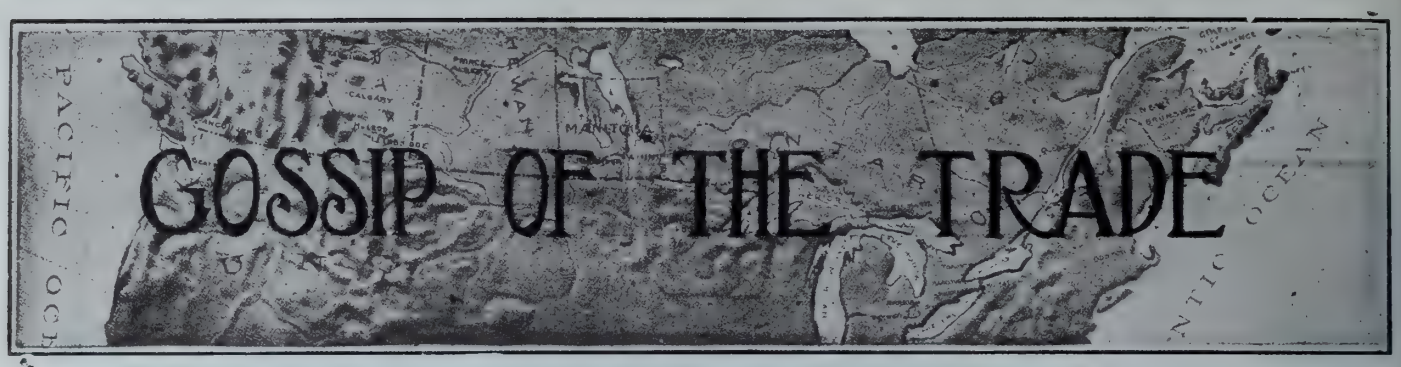
ALUMINUM.—No new developments are recorded and prices show no change from 50c per pound basis ruling for some time past.

ANTIMONY.—Conditions surrounding this market are mainly without change. The demand is very good and price steady at 18c per pound.

PIG IRON.—Production will, it is thought, show a falling off for the month. Supplies are largely being absorbed in war work and this is bound to be the predominating factor in distribution of output for some time to come.

NEW FOLDER ISSUED

The Lord & Burnham Company, of Toronto, have just issued a very interesting folder which contains some useful information regarding the subject of "Bring Down Coal Bills." Those who desire to procure some right up-to-the-minute hints on the subject will do well to write for this folder to the above company, Royal Bank Bldg., Toronto.



BRANDON APPOINTS SANITARY INSPECTOR

The city council have appointed Walter Shillinglaw as sanitary inspector for the city. Twenty-one applications were received for the position, many of which were from men with excellent qualifications, but only the names of two local men were considered. Among those who applied were a number of men from Winnipeg.

OBITUARY

Good men are becoming scarcer almost every day. What with those carried off with the war and from natural causes, conditions are becoming acute.

The sanitary and heating engineering trade will no doubt regret to learn of the death of Will Power, the late sales manager of the Wallaceburg Brass and Iron Manufacturing Co., Wallaceburg.

It came as quite a shock to SANITARY ENGINEER, as it was only a few weeks ago that the writer was visiting the plant of the above concern, and at that time Bro. Power did not appear to be in bad health.

However, he has crossed the "Great Divide" and no one who was acquainted with Mr. Power can help feeling the loss of such a splendid personality.

He was a splendid fellow, his presence was inspiring, clean in business and fair. He has left many who are better for having met him in the flesh, and such being the case his spirit cannot fail to have an influence upon them for good.

SANITARY ENGINEER joins its readers in conveying their heartfelt sympathy for those near and dear whom Will Power left behind, knowing full well that he will be ever present with them in spirit.

NEW PLANT ESTABLISHED BY CRANE LIMITED

The first sod for the erection of a building which is to house the new plant of Crane Limited, Montreal, was turned on Thursday, August 22nd. The site for this plant is on the south bank of the Lachine Canal between Atwater and Cote St. Paul bridges. The property comprises eight acres, bounded on the south by the Grand Trunk Railway tracks, on the north by the Canadian Pacific tracks, with the canal on the north side of St. Patrick street, thus affording most advantageous rail and water facilities for shipping purposes.

The plant when in operation will employ from 400 to 500 hands. It is the intention of the company to manufacture a complete line of valves and fittings, both for Canadian markets and for export trade. The buildings represent an expenditure of approximately $750,000, which with the price of the land makes an investment of nearly one million dollars. With the completion of such a plant in Canada, the sanitary, heating and ventilating engineering trade will be still further assured of another reliable source of supply, which no doubt will prove invaluable when business comes back to its own after the war.

The interesting ceremony of turning the first sod was performed by Mr. R. T. Crane, Jr., of Chicago, president of Crane, Limited, Montreal, in which he

IT'S WHAT YOU DO TO-DAY

It ain't no good in talking 'bout the things you used to do, nor tellin' how the blood you've got is tinted in royal blue. You can't jam stuff across these days when things are in a whirl, about your uncle's grandad once a-speakin' with an earl.

The grocer and the butcher man you can't stand off at all, with yarns that read like romance with fibs what's ten feet tall.

And what's the use in tellin' folks yer uncle owned a farm, a cow, a horse, a pig or two, a drive shed and a barn—or that some other man who camped upon your family sprout, he ate so much and lived so high he pulled a spell of gout.

Why folks don't care a hoot to know 'bout all the slush or frill, or of the water what has gone and slid beneath the mill.

A hen may have a pedigree that's sixteen feet in length, and all her rooster brothers may croak with all their strength—but him what's feedin' her the grain don't reckon she's a peach, until she dumps the eggs about at most a nickel each.

A race horse has a dandy name, she comes of powerful stock, enough, by heck, to make the folks in all the barnyard talk.

But if that bob comes to the scratch to beat all other nags, with jockey decked upon her back in all his yeller rags, why what's the use of all her noise about her pedigree, if some skate makes her look as though she's tied unto a tree?

It's just the same in everything you want to touch or do—this here is old as Moses, it's nothin' bright or new.

It ain't the things you used to do what count with people here, nor what your grandad did or said in times what's past and drear—there's only one thing that can count, there ain't no other way—the world will take you, right or wrong, at what you're worth to-day.—ARK.

was assisted by Mrs. Crane, his son Cornelius and daughter Florence.

Mr. E. C. Townsend, vice-president and general manager of Crane, Limited, and Mrs. Townsend, were also present, together with Mr. W. J. Wall, of 34 Bleury street, who has represented Crane Co. the past fifteen years, Messrs. Brown and Vallance, architects for the building, Mr. Anglin and Mr. Harrington, of Anglins Limited, contractors, and others interested in the erection of the building.

BUFFALO BOYS VISIT TORONTO

Just as we go to press we are informed that the Buffalo sanitary and heating engineers have arrived by boat at Toronto. They are bent upon having a good time, weather is fine and the National Exhibition is now in full swing.

Secretary Frankland of the Toronto Society is in full demand. The busiest man in town. SANITARY ENGINEER will tell its readers all about the trip and what was done by all concerned in the September 15 issue.

DOCTOR FINDS RECRUIT'S HEART ON WRONG SIDE

Philadelphia, Aug. 24.—The credit of being the first man from this city to be rejected from the National Army because "his heart is on the wrong side" goes to George W. Nicholson, twenty-one years old, a plumber from the southern section of the city.

Ever Ready to Slam a Plumber

The above was being read aloud to a number of men recently and the reader of the item remarked very emphatically that the p'umber was unborn whose heart was on the right side. Thinking he was slamming the plumber by such a remark, the writer being one of company replied that natural law prevented anyone from having their heart on the right side, except in very few cases such as that mentioned above.

The rest of the crowd thoroughly enjoyed the joke at the table being so turned on our "plumber slamming friend."

NEW BULLETIN ON STEAM TRAPS

The conservation of fuel is one of the most important duties of every citizen on this continent, and to conserve fuel means that new and up-to-date appliances must be pressed into service. A very interesting bulletin has just been published by the Geo. W. Cole Ltd., 2002 Dundas street, Toronto, which contains some valuable items of information for every heating engineer, one chapter on "Bookkeeping in the Steam Plant" is very good. These bulletins may be procured by writing to the above address.

MONTREAL NOTES

Jos. Laurier in Better Health

The plumbing trade will learn with pleasure of the much improved condition of Jos. Laurier, president of the Canadian Society of Domestic and Heating Engineers, Montreal. It is earnestly hoped that he will soon be completely well again.

THE SECRET OF ADVERTISING

(From Leslie's.)

ADVERTISING! Bradstreet's statement that 84 per cent. of all failures are among non-advertisers is significant. Intelligent advertising has become an essential in every modern industry, but what shall the advertiser do in the face of the war situation when he finds it difficult to get goods to fill his orders? First of all it should be remembered that the foundation purpose of judicious advertising is to fix indelibly the trade-mark in the public's mind. A let-up in that campaign must be fatal to any product. So, we find Mr. George H. Charls, Vice-President of the American Rolling Mill Company, declaring the company's purpose to continue its advertising, although for two and a half years it has been unable to supply the demand for its product. "We are building," said he, "a permanent business edifice, and some day we would have to spend millions of dollars buying back the business and good-will of our clients if they are forsaken in this emergency." Unless advertising is kept up without a break the advertiser loses the results of the initial effort. Here is a warning to the advertiser who neglects the dull season in summer. When advertisements are fewest is the very time when a message to the public will get the most attention. It is good "psychology" to push the advertisement of a winter product in summer and of a summer product in winter.

Price Fixing

The matter of adopting a schedule of charges for plumbing, etc., is being considered by the city of Montreal. It is the intention to adopt the principles cities so that charges may be somewhat uniform for various work. In discussing this with a master plumber SANITARY ENGINEER was told that action of this nature would be beneficial to the trade.

Cutting Down Overhead

The new Civic Commission in the city of Montreal has been using the pruning knife extensively. It reached the plumbing and sanitary departments recently, as well as that of the boiler inspector and quite a shift is reported.

Shortage of Men

Montreal plumbers are surely having a trying time in maintaining their staffs. The large railway companies, munitions firms and other industrial concerns are needing men and will pay high rates to get them. The papers are filled with offers to men of this type and as pointed out to the SANITARY ENGINEER even laborers are receiving as much as 45 cents per hour, and mechanics and plumbers from 55c to 68c per hour. The employing sanitary and heating engineer has his troubles.

STEEL SITUATION IN JAPAN

The steel rolling mill of the Kawasaki Dockyard Co. at Fukai, Kobe, will begin operations in a few days. The plant has a capacity equal to turning out 125 tons a day.

The Hokkaido Steel Works has completed the installation of a smelting furnace with a capacity of 100 tons a day. The new furnace was to start operations at once.

It is reported from Osaga that France and Italy have started their purchase of Japan zinc, thereby enlivening the market here, which has been short of the visible stock on account of the curtailed output of refiners.

Big zinc refiners in Japan, including the Mitzui Co., Suzuki & Co., and others, are going to boost up prices of zinc by their united action to cut down the output. The probable extent of reduction is 25 per cent., it is said.

WINNIPEG PLUMBING DIVISION

Permits Issued

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Inspections

Water Tests	Smoke Tests	Subsequent Inspections	Miscellaneous Inspections	Defects Rectified
71	106	221	12	202

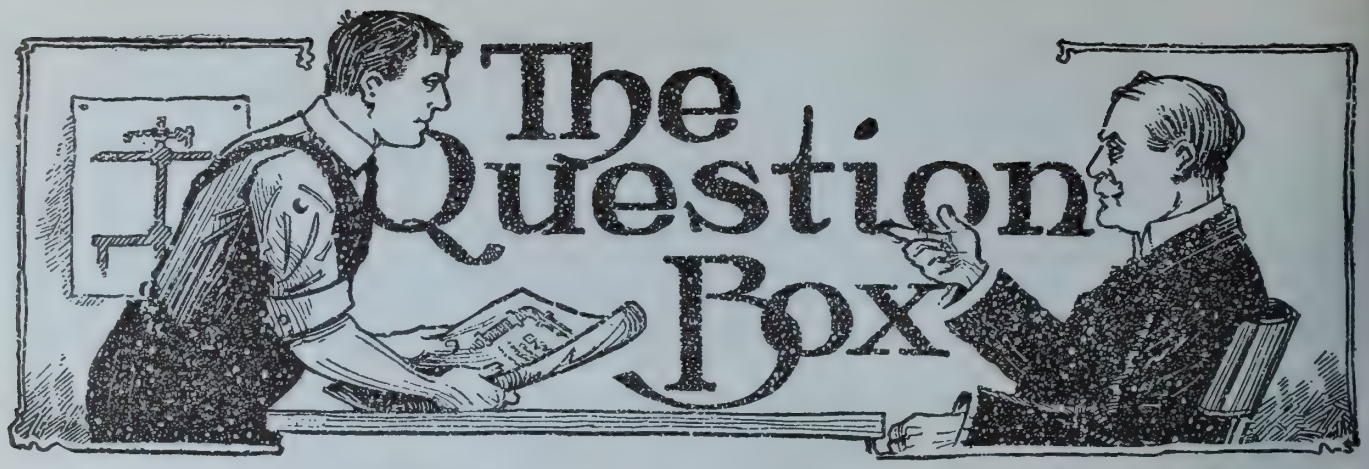
Sewer Division

Permits issued	Connections constructed	Inspections

Sewer Flushing

Tank Flushings Gallons	Hose Flushings Gallons	Total Gallons of Water
707,584	723,750	1,431,334

The above table shows the work accomplished by the Winnipeg Plumbing and Sewer Inspection Department during the month of July—a public service that cannot but be of inestimable value to the citizens of Winnipeg.



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published--Description of Jobs Done or Shop Kinks Are Also Invited.

HOW TO FILTER LAKE WATER EASILY

Editor Sanitary Engineer:—I have been asked to instal a pneumatic water system in a house on a small island. It is more of a large rock than an island and the task of boring the rock is almost out of the question. Furthermore, it is rather doubtful whether water could be procured that would not be merely lake water.

Would it be possible to filter lake water easily and at not too great a cost? Any information on this subject would be very much appreciated by

P. W. S., Ontario.

The above problem is one that will have to be grappled with by many sanitary engineers in Canada particularly if they cater to those residents who have summer homes in the lake districts. There is also the question of sewage disposal, which will be dealt with in a later issue of SANITARY ENGINEER, but as our inquirer does not appear to have this problem to solve we will confine our answer to that of filtering lake water.

The most simple and effective way to filter lake water would be to procure a large barrel, hogshead or butt, and bore a number of holes in the bottom and lower half. Then make a centre piece of either wood or iron in the form of a pipe or tube and drill or bore holes about ½-inch diameter in the pipe, let this be about 6 inches longer than the height of the barrel and fasten it to bottom. Next procure a piece of brass screen wire cloth or netting, similar in mesh to that used on pump points, or say a little finer than fly screen netting, and wrap the screen round the outside of the pipe.

Now procure some coarse gravel, wash same well and fill the barrel up about half full; then put some finer gravel, almost like coarse sand, and mix same with broken charcoal, the latter in pieces about the size of a pea, in bulk one-third charcoal to two-thirds of sand. To make this filter still more efficient, the coarse gravel should be filled to the outside inner wall of the barrel, and the finer close to the screen wire on outside, leaving the centre of the tube or pipe empty.

Now submerge the barrel in the lake to within a few inches of the level of the water, and the water will filter through the gravel and charcoal into the empty centre. Place the pump cylinder in the centre and pump water until clear. Then any water pumped later will be fit to drink. This is, of course, provided that the water is not sewage polluted. Although filtered, we would suggest that a sample be sent to some city or provincial health dept. for test. To do this, a bottle should be sterilized by putting same in the top of a pan or kettle with water in and placing kettle on fire to boil, seeing that the bottle is suspended above the water and only steam entering therein, then allow to cool and while wet with condensed water, fill the bottle with water to be tested and cork up tight.—Editor.

FACTORY SANITATION

Continued from page 17

there are upper floors, to the rooms above.

There are specially constructed local-vent closets made for the express purpose of carrying the objectionable odor away right at the bowl, thus really ventilating both the closet bowl and the room at the same time.

These closets are very satisfactory if proper size of ventilation ducts connected to a positive draft mechanically operated are provided, otherwise they are of doubtful value. Many a battery of bowl vented closets has been a failure because the sanitary engineer installing same has not provided proper ventilating appliances, and has simply trusted to nature to do the ventilating. For small batteries there are ventilator tops that will answer the purpose well.

Instead of ventilating the rooms through the local vents of the individual closet bowl, they may be ventilated through registers situated at the rear of the latter just under the bottom of the tank where tanks are used. Either method may be adopted in a factory where men only are employed, or in the men's toilet rooms of any factory. But for hygienic reasons local-vented closet bowls should not be permitted under any circumstances, the better practice being to ventilate the rooms through registers directly at the back of the closets.

Wash down water closets should never be used, particularly where they would be grouped together in large numbers. They are unsanitary and cannot be made sanitary by any method of ventilation yet devised. They possess a large area of fouling space, making it an almost impossible task to keep clean in a factory building; and the water they contain is too shallow to deodorize the contents. In addition to that, every flushing of the fixture drives the air from within the closet bowl out into the room, whereas a syphon acting water closet bowl carries the air from the closet into the soil pipe along with other contents.

Continued in next issue.

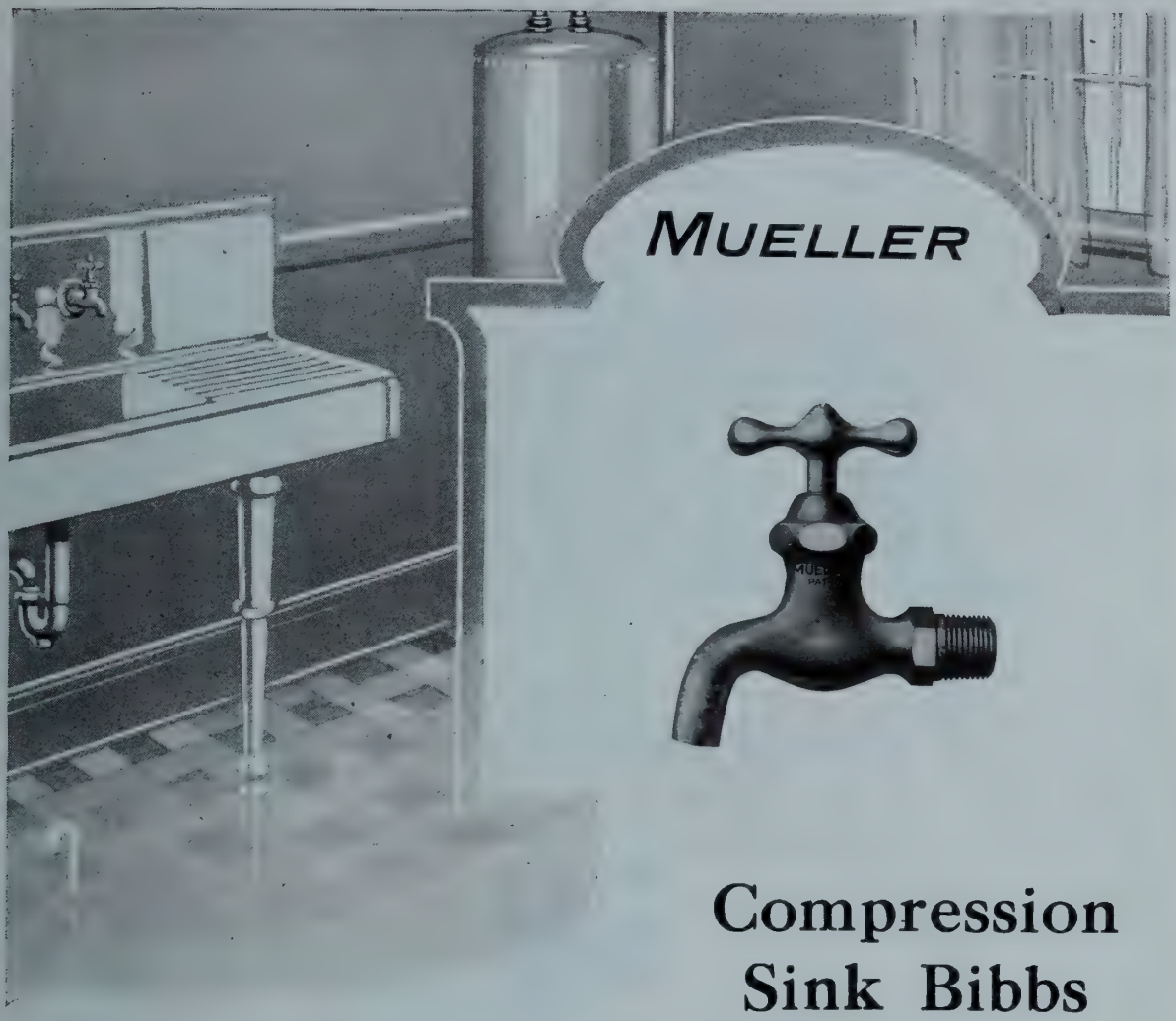
NEW CANADIAN PATENTS

Continued from page 22

apart, the impeller shaft, and an impeller provided with open type blades removably mounted on said shaft within said casing and co-acting with one of said plates to form a running point therewith, the said blades operating between said plates to have clearance therewith.

4. In a centrifugal pump, the combination with the casing thereof made in two sections, the impeller shaft, an impeller provided with open type blades removably mounted on said shaft within said casing, and removable wearing plates mounted within said casing and spaced apart, and with which said blades have clearance.

5. In a centrifugal pump, the combination with the casing thereof made in two sections, non-rotating removable members mounted within said casing and spaced apart, the impeller shaft, and an impeller removably mounted within said casing on said shaft to co-act with said removable members.



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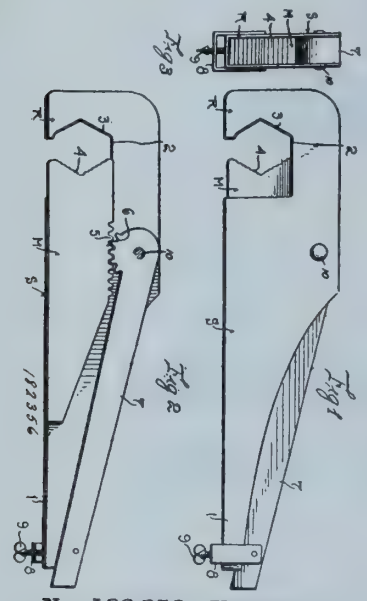
MUELLER

New Patents

No. 182,356.

Peter E. Guthrie, Morristown, South Dakota, U.S.A., 19th February, 1918; 6 years. Filed 5th October, 1917. Receipt No. 286,022.

Claim.—1. A wrench comprising a shank substantially U-shaped in cross section and having the base portion and adjacent sides thereof cut out adjacent an end to afford a jaw, the side walls of the shank affording spaced gripping edges, an elongated member slidably arranged within the shank and co-acting with the jaw thereof, a longitudinal marginal portion of the elongated member contacting with the base portion of the shank, a member connecting the side walls of the shank at a point inwardly of the cut out portion thereof and holding said side walls against relative separating movement and a lever pivotally engaged with said member and co-acting with the second longitudinal margin of the elongated member for imparting sliding movement to the elongated member to or from the jaw.



No. 182,356. Wrench.

2. A wrench comprising a shank U-shaped in cross section and having the base portion cut adjacent an end thereof to afford a jaw, the side walls of the shank affording spaced gripping edges, and elongated member slidably arranged within the shank and co-acting with the jaw of the shank, a longitudinal margin of the elongated member contacting with the base portion of the shank, and means co-acting with the opposite longitudinal margin of the elongated member for imparting sliding movement to the elongated member in a direction toward or from the jaw.

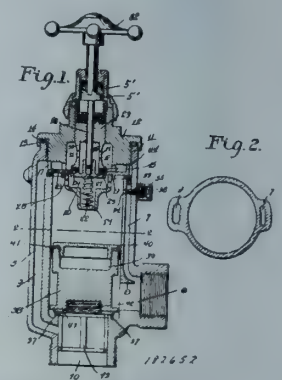
3. A wrench comprising a shank substantially U-shaped in cross section and having one end portion cut out to afford a jaw, an elongated member slidably arranged within the shank and co-acting with the jaw of the shank, a lever pivotally engaged with the shank and co-acting with the movable member to force the movable member toward the jaw of the shank when the lever is swung inwardly toward the shank, and means carried by the lever co-acting with the shank for holding the lever against movement in an opposite direction.

4. A wrench comprising a shank substantially U-shaped in cross section and having one end portion cut out to afford a jaw, an elongated member slidably arranged within the shank and co-acting with the jaw of the shank, a lever pivotally engaged with the shank and co-acting with the movable member to force the movable member toward the jaw of the shank when the lever is swung inwardly toward the shank, means carried by the lever co-acting with the shank for holding the lever against movement in an opposite direction, and a yoke carried by the lever and adapted to straddle the shank to hold the lever against movement away from the shank.

No. 182,652.

James F. De Spirito, Brooklyn, New York, U.S.A., 5th March, 1918; 6 years. Filed 31st December, 1917. Receipt No. 289,219.

Claim.—1. A flushing device comprising the combination with a casing having an upper flange, a lower discharge end, an inlet passage opening into the upper portion of said casing, a connecting passage from the top of said casing to the outlet port thereof, and a valve closing communication between said inlet and said outlet ports, of a removable cap secured in said flange, a removable apertured plate positioned in said casing and having an upstanding flange, a depending flange carried by said cap and resting upon the upper face of said plate to retain the latter in position, said flanges of the plate and the cap having registering openings communicating with the upper end of said connecting passage formed in the casing, said cap having an upper fluid chamber formed therein, valve seat means carried by said cap and extending through said upper fluid chamber, a valve chamber suspended from said plate and having communication with the upper portion of said casing, and with the aperture through said plate, a valve within said valve chamber and normally engaged with said plate and said valve seat means, means for resiliently retaining said second-mentioned valve in normal position, a handle, and means adapted to be operated by either downward or rotary movement of said handle to unseat the second-mentioned valve and permit passage of fluid from the upper portion of said casing to the outlet port of said casing and thereby allow upward movement of the first-mentioned valve to open a direct communication between the inlet and outlet ports of said casing.



182,652. Flushing Device

2. A flushing device comprising a casing having an open upper end and a lower discharge end, said casing having an inlet at one said, a cap for the open end of said casing, an aperture plate positioned between said upper end of the casing and said cap, a valve chamber suspended from said plate, and communicating with the apertures therein, said valve chamber having openings forming communication between the interior thereof and the upper portion of said casing, a stuffing box mounted in said cap, said stuffing box having a depending flange provided with side openings, a valve seat secured between said depending flange and said apertured plate, said cap having a depending flange surrounding and spaced from the hollow depending flange of said stuffing box and provided with openings, a releasing valve within said valve chamber.



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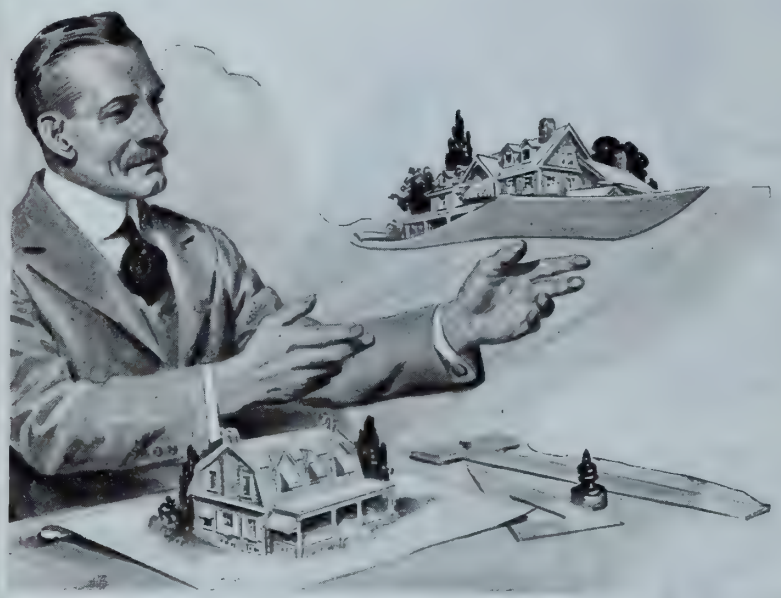
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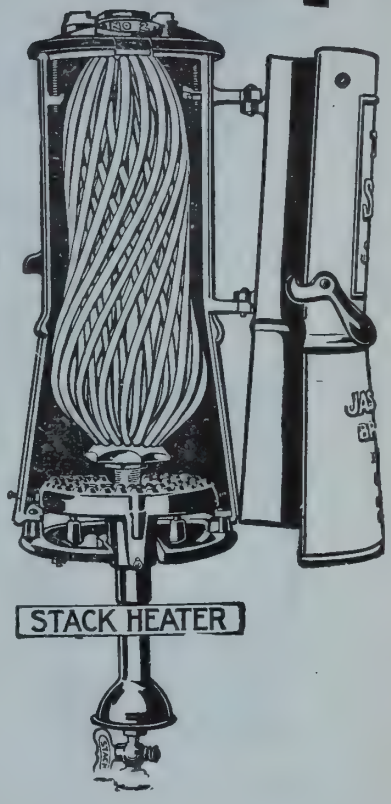
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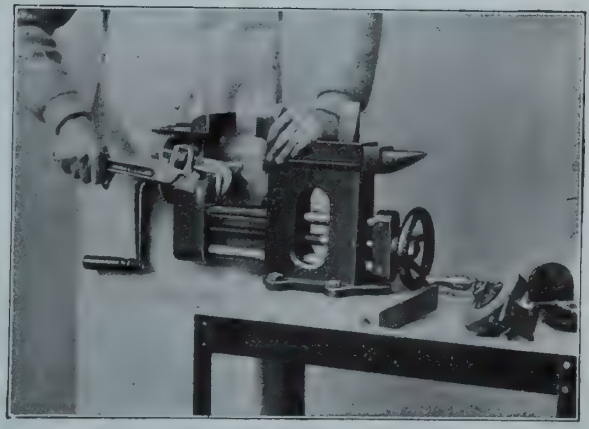


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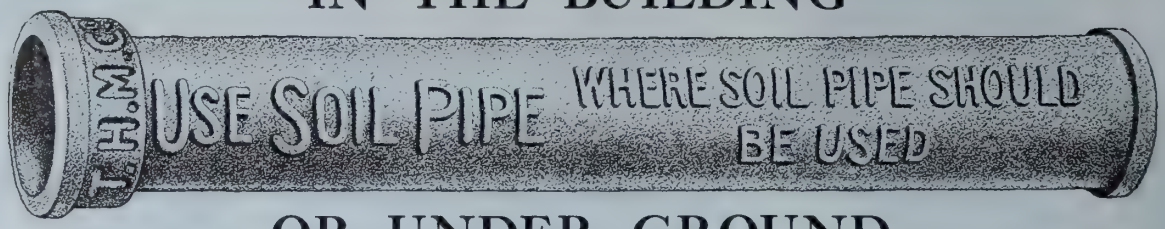
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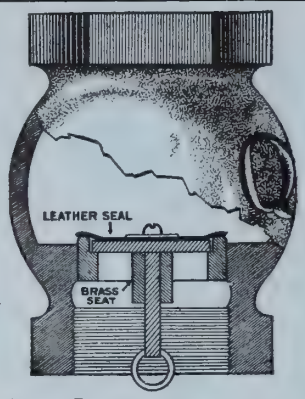


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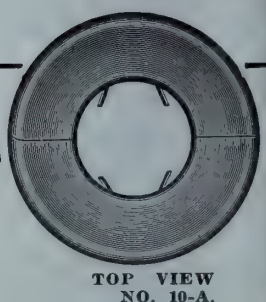
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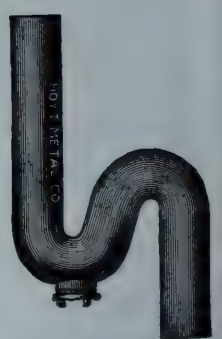
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Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Standard Sanitary Mfg. Co., Ltd., Toronto.

Floor and Ceiling Plates.
Beaton & Cadwell Mfg. Co., New Britain, Conn.,
Beaton & Corbin Mfg. Co., Southington, Conn.
Canadian Wolverine Co., Ltd., Chatham.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
James Morrison Brass Mfg. Co., Ltd., Toronto.
Steel & Radiation, Ltd., Toronto.

Gasoline Engines.
Empire Mfg. Co., London.

Gas Water Heaters.
Empire Mfg. Co., Ltd., London and Toronto.
Holstream Heater Co., Cleveland.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Pittsburg Water Heater Co., Toronto.
Rudd Manufacturing Co., Toronto.

Generators.
James Morrison Brass Mfg. Co., Ltd., Toronto.

Heaters.
Lord & Burnham Co., Toronto
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal and Toronto.

Lead.
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Hoyt Metal Co., Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
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Mixing Valves.
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Empire Mfg. Co., Ltd., London and Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Port Hope Sanitary Mfg. Co., Ltd., Port Hope.

Monkey Wrenches.
Trimont Mfg. Co., Roxbury, Mass.
G. & W. G. Gummer, Ltd., Rotherham, England

Packing.
Canadian Wolverine Co., Ltd., Chatham.

Packless Radiator Valves.
Kerr Engine Works, Walkerville.

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Beaton & Corbin Mfg. Co., Southington, Conn.

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Consumers Metal Co., Ltd.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.

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Chamberlain Desolvo Co., Ltd., Toronto.
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London and Toronto.

Pipe Cutters.
Borden Canadian Co., Ltd., Toronto.
Trimont Mfg. Co., Roxbury, Mass.

Pipe Joint Compounds.
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James Morrison Brass Mfg. Co., Ltd., Toronto.
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Pipe, Soil, and Fittings.
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Empire Mfg. Co., Ltd., London and Toronto.
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H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Toronto Hardware Mfg. Co., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.
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John Hall & Sons, Ltd., Brantford.
A. B. Jardine & Co., Hespeler.

Pipe Wrenches.
Borden Canadian Co., Toronto.
Trimont Mfg. Co., Roxbury, Mass.

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James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
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Empire Mfg. Co., Ltd., London and Toronto.
Hurley Machine Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
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R. MacDougall & Co., Ltd., Galt.

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Beaton & Cadwell Mfg. Co., New Britain, Conn.,

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C. A. Dunham Co., Ltd., Toronto.
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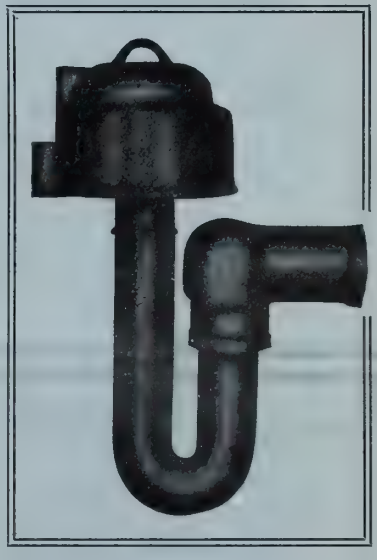
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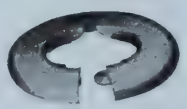
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One of many styles



No. 15

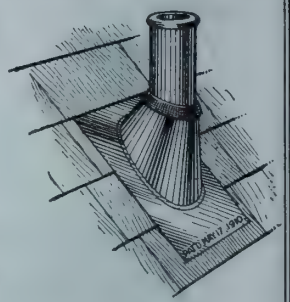
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For steam, water, air, oil, gas, gaskets, etc. The cement that cements. Sets like gum. Allows no leaks.

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Galt, Canada

SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

Vol. XII. Publication Office, Toronto, September 15, 1918 No. 18





"EMPIRE"
FROST-PROOF CLOSETS

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FREEZE



BUILD UP BIGGER BUSINESS
By Installing Frost-Proof Closets

There are lots of sales that can be made in towns where water-closets cannot well be installed in the homes, at least during the war, and no city home is fit for human habitation unless it has some w.c. accommodation. "EMPIRE" JACK FROST will not freeze up, because they are made right and will draw clear of water every time.

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A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

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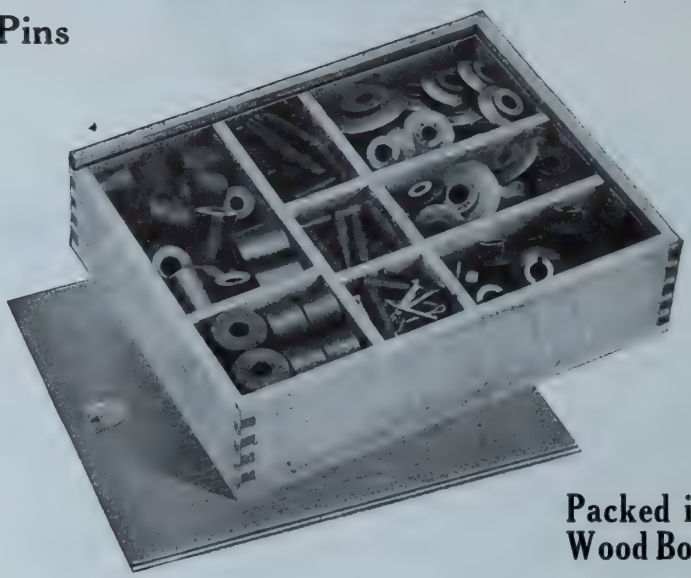
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It is Evidence Like This



"Toledo" Geared Adjustable Threading Tool No. 2 making a cut and thread on a 4-inch bend in position. It was desired to install a steam separator above throttle of engine, and the whole job was satisfactorily completed without removing the pipe line.

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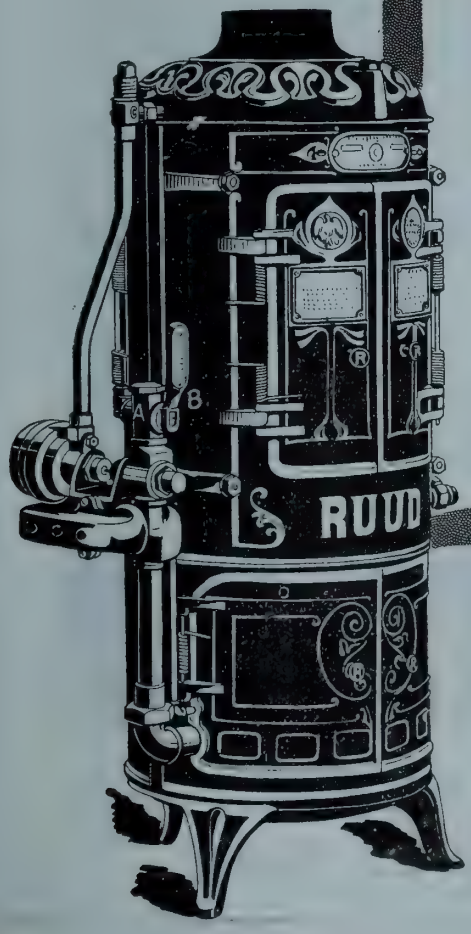
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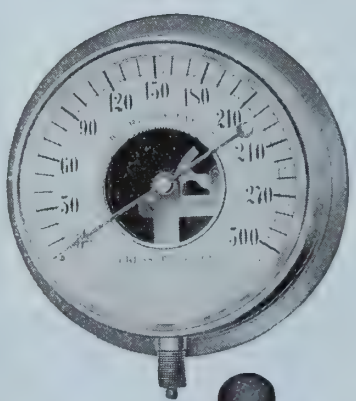
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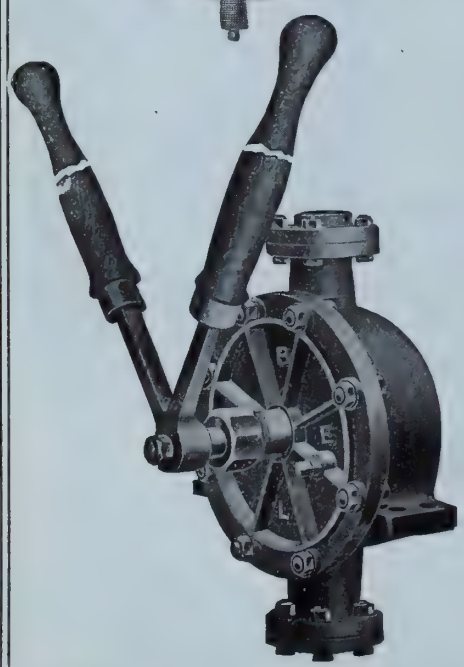
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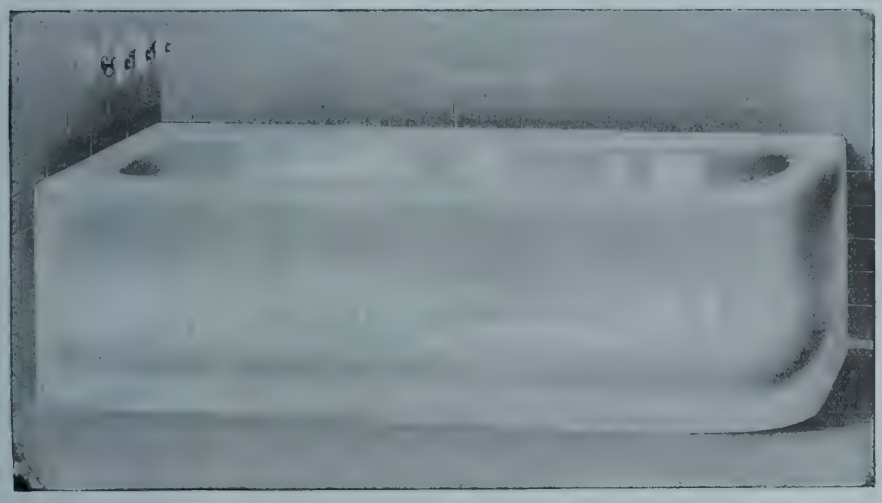
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Made in One Piece Enamelled All Over



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To give our utmost; to put forth our best efforts in the most helpful way, and to expect no premium for our services except the establishing of those principles that will make the world a better place in which to live–that is the slogan with which we must back our boys and the government.

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We have everything for the plumber:

Solder	Lead Wool	Lead Pipe
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Bath Tubs	Sinks	All Brass Goods
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Write for Catalogue "A."

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HAMILTON MONTREAL WINNIPEG VANCOUVER

We Have Everything for the Plumber



Note the depth of the section leg corrugation. It is no mere wrinkle. It is broad and deep.

Ashes insulate! How this is prevented

MOST boiler fires grow dead around the edges. Grow dead because the boilers have one big centre flue at the back; but no side flues.

The Burnham has no back centre flue. I has a side flue between *each* section on *each* side. The draft is equalized. The edges of the fire are practically as lively as the centre.

The leg of each section has a deep corrugation, against which the live edge fire directly contacts. That corrugation prevents the close flat packing of the edge ashes, so assisting in keeping a draft vent.

It adds greatly to the active fire surface. A surface that in most boilers is half dead.

Send for our boiler catalog.

Lord & Burnham Co. Limited of Canada

(Boiler Department)

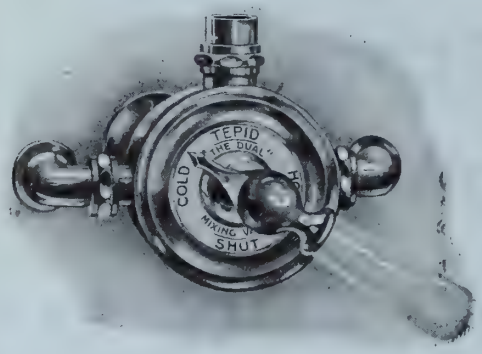
ROYAL BANK BUILDING, TORONTO

Factory: St. Catharines, Ontario

G. & W. G. GUMMER, LIMITED

EFFINGHAM BRASS WORKS, ROTHERHAM, ENGLAND

And at
9 Fenchurch St., London





"Dual" Mixer

A valve that really mixes Hot and Cold Water, and maintains a uniform mixture.

For ease of operation, simple construction and easy installation, it has set a new standard of efficiency.

Cold Water must be turned on first, no possibility of scalding.

Made in several forms for Showers, Sprays, Operating Rooms, etc.

At the well-known works of Messrs. Brunner, Mond & Co. these valves provide baths for 2,500 employees.

G. & W. G. GUMMER, LIMITED

Manufacturers of every description of

Engineers,' Plumbers' and Sanitary Quality Brassware

Mr. Plumber:—

Show-Room Sales Show a Profit



The B.O.T. Children's Seat is a "BIG-SELLER" wherever shown. Will fit any style of Closet Seat. B.O.T. Five Year Guaranteed Construction.

"COMFORT for the KIDDIES"

Be a Bigger Business Builder by Displaying and Talking Guaranteed Goods.

Write for information on our Special "Seat Display Offer"

THE CANADIAN BRASS CO., LIMITED

Toronto Office: B.O.T. Building, 159 Richmond Street West

Galt, Ontario

HOYT METAL GOODS ARE KNOWN

FROM COAST TO COAST



As time-savers there are none equal to our Wiping Solder, Bar or Wire Solder.

Hoyt Lead Traps, bends and waste pipe are in a class by themselves.

All our products are made to formula.



Our Mixed Metal Sales Amount To Over $5,000,000 Annually.

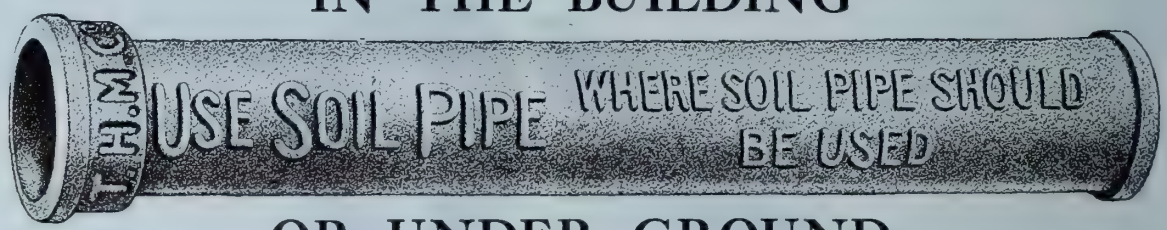
Write your Jobber

HOYT METAL COMPANY, TORONTO, ONTARIO

New York, N. Y., London, Eng., St. Louis, Mo.

Write Us

IN THE BUILDING



OR UNDER GROUND

ASK YOUR JOBBER FOR T.H.M. CO. BRAND OF SOIL PIPE AND FITTINGS.

TORONTO HARDWARE MFG. COMPANY, - Toronto, Canada

WE MANUFACTURE A FULL LINE OF HIGH-GRADE RANGE BOILERS

ADVERTISING to be successful does not necessarily have to produce a basketful of inquiries every day.

The best advertising is the kind that leaves an indelible, ineffaceable impression of the goods advertised on the minds of the greatest possible number of probable buyers, present and future.

Pipe and the Public Welfare

By R. C. McWane

A Book Just Off the Press

Every sanitary engineer should be the possessor of this book. It deals with pipe making of all kinds, cast iron, wrought iron, steel, wood and tile pipe. It is valuable because it gives the users of pipe a true idea of how pipe lasts under various conditions when in service.

Price $1.00 Postpaid

The MacLean Publishing Co., Limited, Book Dept.

University Ave., Toronto

A PATRIOTIC APPEAL

THE Allied Governments need copper to make munitions, and at times like the present every industry stands by the Government, giving up any and all material for war work.

As you know, there is a great deal of copper in a water heater. The United States Government requested all water heater manufacturers to curtail their output so that this copper may be used to make the world a decent place to live in.

We are standing by the Government in this order. There will not be many new "Pittsburgh" Heaters on the market for some time—but if you follow our suggestion this condition will not affect your business in the least.

Everybody needs hot water, and the cheapest means of obtaining it is by a "Pittsburgh" Automatic Gas Water Heater. When a customer wants a new heater—be patriotic—explain the copper tubing conditions and have him let you repair his old heater. Make it a point not to sell a heater to a man who already has one. As the supply of heaters is limited—so then must you limit your sales.

We can supply you with all parts for "Pittsburgh" and "Monarch" heaters necessary for repairs. "Parts" Price Book on request.

PITTSBURG WATER HEATER CO.

Canadian Warehouse: 124 Richmond St. W., TORONTO

DISTRIBUTORS:

WINNIPEG	MONTREAL	TORONTO	CALGARY
	99 Drummond St.	12 Queen St. East	

Success and Your Associates

ALWAYS associate with men who are earning more money than you are. Such is the advice given by a man whose name is known the world over for his own success and the business which he created. It is good advice of a certainty, but we are not urging that it is the best advice. At the same time it is wise to associate with better or bigger men than you are yourself, because you are likely to be lifted up to their levels.

Most of us would probably like to be the intimates of J. P. Morgan, or of John D., or of Charlie Schwab, or Canny Andrew. If we had a speaking acquaintance with John Wanamaker, or Lord Beaverbrook, or Lord Shaughnessy, and with other distinguished and successful men, we would take comfort from the fact.

And most of us would feel rather small and uncomfortable if we were placed beside President Woodrow Wilson at a dinner table, or beside Sir Robert Borden, Sir Herbert Holt or Sir Wm. Mackenzie. And the reason would probably be that we know so little of the knowledge that really counts. If these successful business men engaged us in conversation we would probably find ourselves knowing very little about the things that matter.

This will illustrate the point:

Here's a true story. A Toronto manufacturer found himself on a train going to Albany in company with a number of distinguished Americans about to attend the inaugural ceremonies of a State Governor. A washout led to a delay, and the Canadian was thrown into close association with senators and congressmen and prominent lawyers. They bantered the little Canadian about Canada. He had the pluck of a bigger man. He had been a constant reader of THE FINANCIAL POST, and had absorbed many facts about Canada. He surprised his American travelling companions with his positive, well-informed and wide knowledge of Canada. When the company reached Albany, the Canadian was persuaded to attend the ceremonies and was introduced as the man who knew all about Canada. The Governor was interested in Canada, and said so, and the little Canadian found himself telling the story of Canada very ardently to a very attentive listener, much to the amusement of his friends who introduced him.

This man made a hit on that journey, and many friends. One of the company gave him a stock market tip worth a fortune.

The point of this story is: You, as a Canadian, can make yourself informed very fully and intelligently if you become a regular reader of THE FINANCIAL POST. You can make yourself a worthy companion and intimate of presidents and magnates. The world likes to listen to men who know something well, and who can talk interestingly and informingly on the subject of their study.

You can become worth listening to if you know your Canada well. And you can get the kind and amount of knowledge concerning Canada which will make you interesting to others if you will read THE FINANCIAL POST regularly each week.

IF you read THE FINANCIAL POST REGULARLY you will find yourself keeping company with the highest paid staff of editors engaged on any publication in Canada—trained men who know how to make others know what they know and learn.

You will find yourself living in a most interesting world—the great, throbbing world of business. You will have your thoughts tremendously stimulated and helpfully directed. You will find yourself becoming a fit table companion for big men — this because you will have knowledge of a quality that will keep you from shame.

What is it that keeps you and THE POST separated? It cannot be its subscription price of $3. Probably it is because you are not very well acquainted with this paper.

We are going to put it to you this way: If you have the desire to be worthy of association with big men, then prepare yourself for such association by reading THE POST, and to make acquaintance easy, we provide the coupon below. It offers you THE POST for four months for a dollar bill.

- - - -



A REAL BOOSTER
AND
A CANADIAN

There is quite a difference between trying to sell a person something that he may like to have after you have persuaded him to like it, and selling him something that will save REAL MONEY.

Don't make any mistake. That's what you do when you sell your customer a

CLARK TEMPERATURE BOOSTER

You make real money for yourself and you save real money for him. But you do more.

READ THIS

"It is estimated that something like 5,000,000 tons of fuel is wasted in Canada every year, fuel that has to be imported into the country, fuel that has to be handled several times before it is used. Then when it is burned this 5,000,000 tons of fuel while burned is not put to useful service.

"Just imagine what a problem that is for our railroads to cope with; just imagine how much war material or food stuff could be handled if this waste was cut out."

GALT BRASS CO., LIMITED
GALT **CANADA**



There's Money In IT for YOU!

Heating Engineers will welcome this, the latest and greatest invention in connection with their profession.

"A 'perfect' heating system."

That is the only description that can be given to the "Dodd Heating System"—eliminating, as it does, all the faults and shortcomings of the coal-fired boiler.

THE DODD GAS HEATER

Fired by gas (the cleanest of fuels); automatically controlled and regulated by a Thermostat. Constructed on scientific principles—fool-proof—and above all economical in operation, the "Dodd" is the ideal heater—it may be used wherever a hot-water, steam or vapor system is installed.

The owner of a Dodd Gas Heater has no furnace trouble—no cellar work.

To obtain heat, it is only necessary to light the pilot-light—set the Thermostat to the degree of heat desired—and leave the Dodd to do its work. It will "carry on" night and day—week in, week out—throughout the Fall, Winter and Spring, burning only sufficient gas to give the necessary heat.

We have faith in our product—a mighty faith. We have tested the Dodd Heater under all conditions—and can show you recording charts, fuel-consumption accounts, consulting heating engineers' certificates. Moreover, we are prepared to give a strong guarantee with every Dodd Gas Heater.

Your clients want to know about this perfect heating system—we want you to tell them all about it. In order to do this, you must investigate our claims—and understand our system. Spend a little of your time in making an investigation.

We will advertise this Heater extensively. You will be questioned by your clients—have your information ready. Be posted. Know the fine points of our system, so that you can talk it intelligently.

Co-operate with us in introducing to the public the ideal heating system—one that will bring you added prestige and substantial profit.

We will help you in every way possible—let us explain our sales plan.

THE DODD HEATING SYSTEMS LIMITED

34½ VICTORIA STREET - - - TORONTO, ONTARIO

SANITARY ENGINEER

VOL. XII. SEPTEMBER 15, 1918 No. 18

Possibilities Ahead of the Gas Industry

Some Splendid Food For Thought For Every Sanitary and Heating Engineer — With Gas Consumption Increasing, the Sale of Gas Appliances Must Also be on the Increase

MUCH has been said and written about the future of the gas industry, but if we were to take the average man's idea of the future of the industry as a criterion we would not have any future at all.

It is for this reason, and in an endeavor to stimulate a greater interest in the future of the industry, that I have written this paper, hoping it may be the means of creating enthusiasm among the rank and file engaged in our business, and trusting that some action might be taken towards putting the gas industry on a permanent footing, and making it one of the greatest of public utilities, and an economic solution of our future fuel problems.

The success of the gas industry in the future will only be the sum of the efforts expended by each and every individual in the industry. We must have men in our ranks who believe in the business and are willing to work in its interests for the common good of all. In fact, all of us should put forward an honest endeavor to make it a success, whether we have the facts or not, to substantiate our faith in the business. I will, therefore, in as few words as possible, advance some of the good things collected from various sources that betoken the great future that is in store for the business in which we are engaged, and earnestly hope that this short paper, with what facts it does contain, will stimulate everyone of us to greater action.

In a small way I have in the past put forward every effort at my command to stimulate interest in our industry, but standing alone in any work is not always what it is "cracked up" to be.

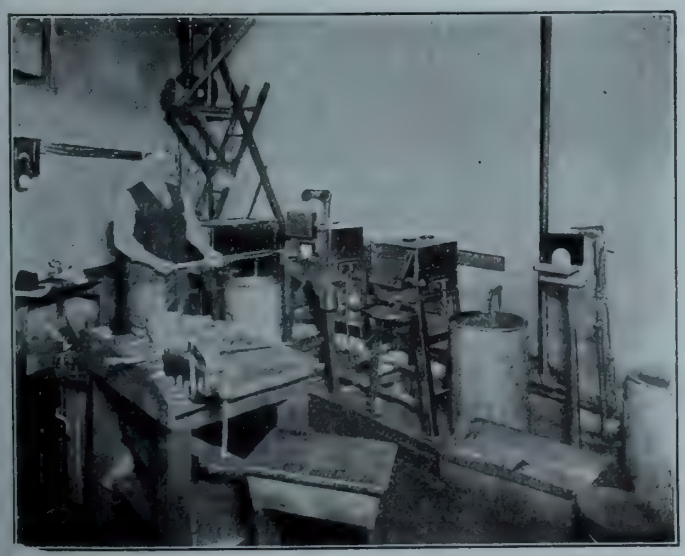
I, however, believe there should be a committee brought into existence for the express purpose of vigorously developing the gas industry.

Quoting, in part from an editorial entitled "Vigorous Development Committee for the Gas Industry," written by Mr. Walter King, editor of the "Gas Journal" of London, issue of June 25, 1918, he states that "There is not in existence a committee answering the description in our title. It may, therefore, in a measure, be somewhat misleading. Such a committee, however, is a vital want in the gas industry to-day, and it is a matter of the greatest importance that a very strong effort should be made to secure some general movement in regard to the establishing of one, and to get it to proceed to work without delay."

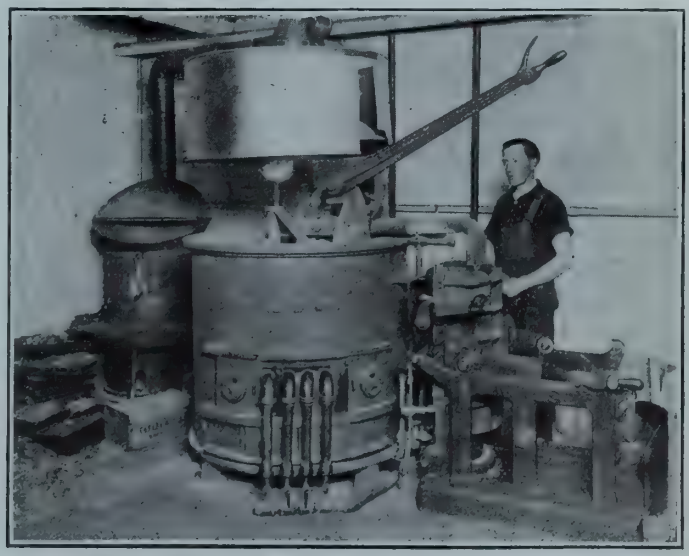
"There are in the gas industry men who appear incapable of seeing the facts of the position as they are; there are those who are lethargic in regard to these facts, and there are those who are content to think that, though the war has sent difficulties in veritable deluge on the industry it has also revealed such potentiality in extended service of the industry that all will be well. It will not be well with the industry unless some determined movement is made to defend its birthright and to plan it and to make secure the lines of its destiny.

"For years we have been preaching the need for a strong organization representative of the whole of the interests of the gas industry. Very largely, what has been said has fallen on deaf ears, and in the result only a little patching up has been done. During the period of the war, effort has been made in these columns, with other industries on the alert, and making a move to consider their positions, to get the industry to adopt a definite reconstruction and progressive policy. But nothing has been done except a little research into the composition of gas. It seems the industry is without any attempt to help its adopting the pusillanimous course of waiting for something to turn up, and

(Continued on page 32)



Gas fired tool room equipment.



Gas fired metal melting furnaces.

Forms for Plumbing and Plumbers

Showing a Number of Forms in Use by the Plumbing Inspection Department at Brantford, Ontario—Each Person Engaged in Plumbing Construction Must Furnish Two Sureties of Two Hundred and Fifty Dollars

A NUMBER of years ago SANITARY ENGINEER advocated that the trade should furnish a bond as a guarantee of good faith that work executed by plumbers and sanitary engineers should be done in a first-class manner and in full accordance at all times with the laws and by-laws then in force. This was advocated with a view of protecting the public from being deceived wilfully or not by men who were not practical mechanics, or men who, when finding that they had taken a job at too low a price, were likely to skimp, or instal goods not strictly in accordance with by-laws in operation, as well as doing work that would require time alone to prove to be defective.

Just to illustrate our point, we will relate a case in which a job was actually done in a city where a rather rigid by-law was in force but as the defective work was in between the joists, and could not be detected, the plumbers got away with it.

EDITOR'S NOTE

There should be some law in connection with the incorporation act of towns and villages which would demand that when a city, town or village becomes an incorporated municipality that town should be made to adopt some form of by-laws in connection with sanitary engineers and sanitary engineering such as is described in this article. Forms shown herewith could be adopted by every municipality to advantage, all of which would result in higher standard of workmanship and greater protection to the public at large.

A certain apartment house was erected. In some way or other the vertical piece of the lead bends for the water closets were three inches short. A water test was put on before the joists were placed and as far as could be seen all was O. K. However, in spite of the fact that the regular water test was O. K. every joint found tight in the testing of the "roughing in" the final work was nothing short of a "botch."

The plumber, instead of taking the lead bends out, or wiping a piece of four-inch pipe on, simply beat a piece of lead down so as to make it enter the four-inch lead, about three inches, then ran some thick paint with a little extra shellac mixed with it, in between the inner and outer pieces, then smeared some putty around the top. The brass flange was soldered on in the usual way, the smoke test put on and the job passed.

Now, there can be no doubt that if it was necessary for every workman or employer to furnish a bond as is required by the Brantford municipality, such work would not likely be done. Time only will prove that this work was in the first place defective, and in all the public

Know all Men by these Presents:

That I, ... of the City of Brantford ..... and hereinafter called the Principal and ..... and ..... both of the said City, ... holders hereinafter called the Sureties, are held and firmly bound to the Corporation of the said City of Brantford, the said Principal in the penal sum of five hundred dollars, and we the said sureties in the penal sum of two hundred and fifty dollars each, to be paid to the said Corporation of the said City, or to their certain attorney, successors or assigns, for which payment to be well and truly made we severally bind ourselves, our and each of our several heirs, executors and administrators, and every of them firmly by these presents

Sealed with our several and respective seals and dated this .....day of ..... in the year of our Lord one thousand nine hundred and .....

WHEREAS the said ..... has applied for a License from the City Clerk of the said City of Brantford, to exercise his calling, business or profession as a Plumber within the said City, as in said License expressed, and has been requested to furnish two sureties to the said city to the satisfaction of the Chairman of the Board of Health for the said City.

And the said ..... and ..... have consented to become securities to the extent of two hundred and fifty dollars each, and to execute these presents.

NOW, the condition of the above obligation is such, that if the above bounden Principal is a practical Plumber, or if he shall hereafter employ a sufficient number or regularly educated, practical and experienced Plumbers to do all such Plumbing work as he may engage to do; and if he the said ..... shall not permit or allow any such work to be done by or for himself or in connection with his business, except by such competent workman; and if he shall not violate any of the terms and conditions, rules and regulations contained in By-Law No. 1171, and in any other By-Law in force at the time of execution hereof, or which may hereafter be passed by the Council of the Corporation of the City of Brantford, relating to plumbing, drainage, sanitary matters, and the Brantford Water Works, then this obligation to be void, else to remain in full force and virtue.

Signed and Sealed in presence of .....

Approved.

Chairman or Board of Health

Fig. 1

PETITION

FOR MASTER PLUMBER'S LICENSE

The Petition of .....

SHEWETH:

That I am a resident ratepayer of the City of Brantford, that my place of business is Number ..... Street, in the ..... Ward, and that I reside at No. ..... Street in the ..... Ward; that I am of the full age of twenty-one years; that the names of my two sureties are: .....

who reside at .....

Your petitioner therefore pray that ..... credentials and qualifications be examined without delay, and that your petitioner be granted a MASTER PLUMBER'S LICENSE for the City of Brantford.

Brantford, this ..... day of 191

APPROVED:

City Engineer.

Medical Health Officer

Fig. 2

would be protected as also would the whole trade, because provision would be made to take in all conditions which may arise during the installing of work. Fig. 1 shows a form in connection with the furnishing of two sureties to the city of Brantford. Fig. 2 shows a form that must be filled out and approved of before a person can procure a plumbers' license in the city of Brantford. This form, like Fig. 1, must bear the names of the two sureties given when the form Fig. 2 is filled out. It will be seen that certain credentials and other documents proving the practical qualifications must be furnished when a person applies or petitions for a license.

It will be noted that a special permit must be granted before the street portion of sewers, either sanitary or storm sewer, can be connected to the main sewes in the street. Fig. 3 is a reproduction in facsimile of one of the forms referred to in connection with storm sewers.

CITY OF BRANTFORD
ENGINEER'S DEPT.

PLUMBING INSPECTION

Dear Sir:—
The plumbing at your property,

No. .....St.
has been inspected and the following work is required to be done in order to make it sanitary:

.....

.....

.....

.....

.....

.....

Kindly have this work carried out immediately as required by By-law No. 1450

.....
Plumbing Inspector

.....19

Fig. 7

The form required to be filled up when the street portion of the house sewer is connected, is shown in Fig. 4. Fig. 5 shows a form which has to be filled out when certain fixtures are to be installed, and Fig. 6 is facsimile of form showing a part ruled in sections for the purpose of drawing a plan of the piping as well as the location of the fixtures to be installed.

Another very interesting as well as valuable service rendered the public of Brantford by the plumbing inspection department is that of inspecting and reporting on the condition of plumbing.

The inspector makes periodical calls, or inspects plumbing which he may think is not in the best state of repair, a condition which is likely to create a menace to the health of the occupants, or even persons living in the vicinity of buildings in which plumbing is situated.

The plumbing inspector sends a form fully filled out (See Fig. 7). It is short, easy to read and understand and furthermore the case is followed up where

BRANTFORD SEWERAGE WORKS

STREET PORTION OF STORM SEWER

Permit No. BRANTFORD, 191
For a connection with the Sewer
for premises situated on side of Street
between Street and Street
House No. occupied by
Street portion to be done by
Lot portion to be done by
Remarks

City Engineer.

Connection
inch, distant feet from

Fig. 3

BRANTFORD SEWERAGE WORKS

STREET PORTION OF HOUSE SEWER

Permit No. BRANTFORD 191
For a connection with the Sewer
for premises situated on side of Street
between Street and Street
House No. occupied by
in accordance with the provisions of by-laws Nos. 433 and 436, and any other By-laws which may from time to time be passed regulating the Sewers of the City of Brantford.
Street portion to be done by
Lot portion to be done by
Remarks

City Engineer.

Connection
inch, distant feet from

Fig. 4

Brantford Sewerage Works

Plumbing Application No. . . . . (TO BE IN DUPLICATE)

Brantford, ONTARIO 191

The undersigned hereby apply for permission to do the Plumbing Work in the premises on the . . . . . side of . . . . . Street, House No. . . . . owned by . . . . . and occupied by . . . . . in accordance with the following description and plan ;

FIXTURES	FLOORS Basement	Ground	1st	2nd	3rd	REMARKS
CLOSETS						
BATHS						
BASINS						
SINKS						
SLOP SINKS						
URINALS						
LAUNDRY TUBS						
CELLAR DRAINS						
OTHER FIXTURES						

We hereby agree to conform strictly to all the provisions of By-Laws 1150, and to all the rules and regulations relating to plumbing made by the Corporation, and to give the due notice when work is ready for inspection; and to leave all pipes and fixtures accessible.

Owner

Licensed Plumber

Fig. 5

plumbing requires to be put into good condition, and as soon as such repairs have been made as defined on the form, no further action is necessary.

In conclusion, we feel sure that our readers will agree with us that on the whole the city of Brantford is to be congratulated at having such a complete and practical method of inspection of sanitary plumbing, and from what SANITARY ENGINEER can learn, the trade of Brantford are alive to this fact and do their very best to give the best of service to their customers.

BRANTFORD SEWERAGE WORKS

PLUMBING APPLICATION

(To be in Duplicate)

No . . . .

Premises on the . . . . . side

of . . . . . Street

House No. . . . . .

Owned by . . . . . .

Occupied by . . . . . .

Licensed Plumber . . . . . .

Fees, New Plumbing $1.00

Fixtures 25c each, additional

Total $

This above work has been inspected this . . . . .

. . . . . day of . . . . . 191. .

by . . . . . .

and is hereby approved

. . . . . .

Inspector of Plumbing

PLAN

On this page draw a Sketch of the plumbing, not necessarily to the scale, showing position of fixtures, vent pipes, waste pipes, and ground plan.

Fig. 6



The Government Building and Western Entrance to the Exhibition.

Fortieth Canadian National Exhibition

An Exhibition Full of Ideas for the Thrifty—Time-Saving and Money-Saving Devices of All Kinds Were in Evidence, Conservation Being the Dominating Spirit Displayed Throughout the Whole Exhibition

"PRODUCE and Save" was the 1918 watchword of the Canadian National Exhibition, and its whole organization was devoted to the promotion of war-time measures. Where there is plenty there is waste and extravagance. This characteristic the Exhibition association certainly did its best to help the nation combat after the generous harvests have been garnered. The farmer, having done his best despite the labor shortage and many other serious handicaps, the housewife and consumer must lend their co-operation. There may be abundant food at home, and much to spare for the boys at the front, but that which we must spare must be carried over three thousand submarine-menaced miles, when every ton of ocean shipping is precious. With little inconvenience and without a solitary meal being less nutritive or delectable, home consumption can be shifted towards foods that are less available for export, and in that way every individual can help conquer the U-boats. In order to demonstrate how everyone may contribute to the war time efficiency of the nation, the fortieth Exhibition was turned into a huge food-saving camp, and in co-operation with the Governments, Federal and Provincial, every possible agency was utilized to teach in a practical, helpful way, food conservation and substitution. In addition to the special appeal to the consumer, there was also assembled for the benefit of the progressive farmer a magnificent display of farm labor-saving machinery, that he may find methods of complying with the request of Hon. T. A. Crerar, Minister of Agriculture, who has sent this message to the farmers of Canada: "Plan to bring as much new land under cultivation for another crop as possible, and thus increase acreage for 1919. It will be needed then just as much as now."

It was rather to be regretted, however, that fewer exhibitors were in evidence in connection with the sanitary and heating industry. Without doubt those who were on hand conducted some very fine displays.

SANITARY ENGINEER is sounding a warning note to manufacturers when it declares that there is a severe reckoning day coming to those who appear to have lost all semblance of pride in their products. It requires a good deal of personal effort we know to get out and put up an attractive exhibit year after year, but if the public are to be shown what manufacturers of sanitary and heating goods have into store for them the latter should turn out and have their goods more in evidence than was the case this year.

We doubt very much if there was one member of the trade doing business within several miles of Toronto who did not visit the exhibition. SANITARY ENGINEER saw hundreds of them and many were the remarks of disappointment at not seeing their calling better represented.

The Bigger Business Building idea boils down to a fizzle when such a splendid opportunity as a nation-wide exhibition is not taken advantage of to the full. It simply amounts to this, that

Continued on page 25



Good Showrooms Help Business

Over ten thousand of the million people that attended Canada's National Exposition visited our display in the Process Building.

Many left their names and addresses with a request that a representative call on them. Others expressed their intention of making installations in the immediate future—but the real point is that all were interested in Plumbers' Enamelled Sanitary Ware.

This information is passed on to the trade as it emphasizes the value of a showroom and a good display, and shows that the people are not only interested but are ready to do business.

When you come to think of it there are many reasons why more Plumbing Goods should be sold. People have the money to pay for them; the prices are moderate, really low in comparison with other commodities; and plumbing is not a luxury—it's an essential and makes the home a fit place to live in.

A good showroom promotes business and PORT HOPE Enamelware will help the contractor to close the contract.

Port Hope Sanitary Mfg. Co., Limited

Factory:
PORT HOPE, ONTARIO

Head Office:
ROYAL BANK BUILDING, TORONTO

TORONTO SHOW ROOMS
119 King St. East

WINNIPEG OFFICE
405 Tribune Bldg.

MONTREAL SHOWROOMS
234 Beaver Hall Hill



Making Farm Homes Comfortable

THE main idea carried out in the James Robertson Co.'s Exhibit this year was to show Sanitary Engineers how to make farm homes comfortable by installing their line of goods.

High-grade brass goods, though not expensive, were displayed; one line in particular, that of "The Riley." This type of compression work is certainly proving a wonder. Every person calling at the exhibit vouched for the quality and lasting service procured when "Riley" lines are installed.

The combination kitchen sink and laundry tub came in for no small amount of favorable comment. Its appearance and general design seemed to appeal to all who saw it.

This fixture is peculiarly adaptable for farm homes, as many are built without basements under the kitchen, and by installing a combined sink and laundry tub, they waste into a septic tank easily.

Pneumatic water systems on exhibit at this booth proved very interesting to all, particularly on "Farmers' Day," when thousands of circulars, specially gotten up so as to appeal to farmers, were distributed. Every Sanitary Engineer should see this folder, entitled, "Making the Farm Home More Comfortable." It contains some good selling points.

The James Robertson Company, Limited
Toronto, Canada

SANITARY ENGINEER

PUBLISHED ON THE FIRST AND FIFTEENTH OF EACH MONTH.

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EDWIN NEWSOME - - - - - - - Editor

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VOL. XII. SEPTEMBER 16 No. 18

WANTED A FEDERAL HEATING BY-LAW

ONE of the most popular topics of the day is the coal and fuel question. Every second person one meets on the street is liable to ask: "Well, have you got your coal in yet?" and many are there who will reply: "No, I've had mine ordered since away back in April." Another is apt to add that his cheque or money has been returned, etc. But what does all this mean? It simply means that coal is likely to be scarce now for many a long year. It means that no one should be allowed directly or indirectly to waste coal. How is this to be prevented? Simply by noting the cubic contents of every building, determining the heat loss and allowing just that amount of coal necessary to heat the building to a maximum of 68 degrees.

Our fuel controller at Ottawa should put more practical methods into practice than he is doing. He should go first to large consumers and find out their requirements and upon what basis such wants are determined, and if the fuel controller or of course those he delegates report that certain heating plants are wasteful, such plants should be put into shape at once and only a supply of coal granted them that will, if the plant is put into good working order, waste a minimum amount of fuel. So much for heating and power plants that are already in operation.

New Installations

But how about new heating plants? Are we to continue day after day, year after year, installing poor, unpractical heating systems? Are we going to instal heating plants that will go on for time unlimited wasting fuel? We should not, and the only way that coal saving can be adopted practically would be to have a federal heating by-law put into force.

Such a law need not be cumbersome, it need not be so rigid that varying climatic conditions could not be given practical consideration, but such a heating by-law as could be as uniform as possible, with the main point in view, the saving of coal.

Such a by-law should demand that the size of all heating systems be based upon the heat loss of a building, and that no building be allowed to be erected that would have more than a certain heat loss, according to the type of building and purpose for which it is erected.

For example, a factory is to be erected for manufacturing certain goods and an extraordinary amount of light is needed. Very well, the nature of manufacture would be used as a basis for heat loss.

The chimney should be given more attention, and all piping, as well as boilers should be covered with insulation so as to conserve the heat generated, provided of course that the heat from exposed furnace and piping was not required.

Sanitary Engineer has devoted a lot of space to this question and has always maintained that all heating plants should be inspected at least once a year.

In this connection the editor took up this question in the Toronto daily papers last Spring and was told in as many words that while the city architect's duty was to inspect buildings, etc., he was not concerned in the least as to the furnishing of a building, or whether the house was cold or difficult to heat.

However, a change has come over the Toronto city architect's department and we are informed that in view of the scarcity and high cost of fuel City Architect Pearse is considering a warmer type of house for Toronto so that fuel bills may be lessened. Warmer houses would cost more to construct, and it is just a question with the officials as to whether such a type at a greater cost would be acceptable to the people on the possibility of using less coal."

As to the "acceptability," etc., Sanitary Engineer cannot look upon the question with any doubt. Houses and buildings to-day are in the main constructed of good material. But the material is badly put together. Sashes and doors should be better fitted, beam filling should be done properly, all sashes should be made so as to allow storm windows being fitted in on the inside and made air-tight. A double window is only a joke as a cold insulator unless the space between the two panes is air-tight. As to the cost of such buildings, there would be likely a slightly higher first cost but upkeep would be lower and there would be coal for all and at lower prices.



FACTORY SANITATION

If I wanted to know about the abilities of a factory manager, I would ask to see the toilet accommodation provided for the employees.

By Thomas Stansfield
Sanitary Engineer

Such a battery of water closets installed in a factory cannot help but be an asset. Workmen are not slow to appreciate such accommodations particularly when the closets are kept well cleaned.

ARTICLE III.

THE sanitary condition of the factory now-a-days is not a question merely as between employer and employee. The public is taking a deeper interest in sanitary comforts and conveniences, and is taking the stand that unsanitary factories and workshops cannot be fit places from which to buy goods. The writer once learned of a laundry where very poor W.C. and other accommodations were provided for the employees, and as a result of the rumor made a call upon the proprietor and informed him that his business could not progress if the public became aware of the fact that their clothes were being washed by people who did not keep themselves clean, and the best way was to furnish lots of toilet and other sanitary accommodation. The writer learned from this manager that they had a lot of sickness in their factory, that customers were not held for very long, also that in spite of new customers their business did not appear to be forging ahead as it should.

Upon looking over the toilet rooms it was found that only four W.C.'s were furnished for over 300 hands, two for males and two for females.

The girls worked in rooms filled with steam, the ironers left their work perspiring, the toilet rooms were just cubby holes and very seldom cleaned out. But all this has since been changed, every room has been well ventilated, lockers have been provided, one part of the factory has been set aside for the exclusive convenience of all the employees. A matron has been engaged to see to the general comfort of the employees so that the saving in time formerly lost is reduced and the output of the factory is increasing every week. The whole tone of every one employed from the management down to the most humble employee is greatly improved, and the favorable publicity has become quite an asset to the proprietor.

The management of a plant must of course look for profit, and experience has proved that the best managed factory or workshop makes the most profit. In well-managed factories the floors are kept as clean as the kitchen floor of most homes, because all employees can work to better advantage on clean floors.

It stands to reason that a shop foreman or manager who insists upon having the floors kept clean will not tolerate filthy and unsanitary W.C. accommodation. Take for example the battery of W.C.'s shown in the heading of this article, would you not prefer to work, even as foreman, manager, or superintendent in a factory having such accommodation, rather than in one which provided such filthy and unsanitary holes as shown in previous articles. Just turn back to the first two articles and note the illustrations again by way of making a comparison.

There is no evidence of unsanitary conditions in the illustrations that accompany this article, the walls are clean and fresh looking, the air is pure, and no objectionable odor can penetrate the rooms of the building; the employees appreciate the convenience and comfort of good sanitary appliances, while last but not least the general tone of the rooms is elevated.



Separate steel lockers shown here. Note the immense size of this locker room, the splendid natural light and height of open girdered roof which guarantees lots of ventilation as well as pure air.

Slop Sinks in Factories

It would be rather a difficult task if one were to try and lay down a hard and fast rule regarding the installation of



Quite a contrast to some of the filthy conveniences as shown in previous articles. No evidence of insanitary conditions here. Employees cannot help but appreciate such splendid accommodation. Note theventilation ducts near ceiling.

slop sinks in factories, as the products of the factory would have an important bearing upon the question. For example, in a machine shop, or metal-working factory, slop sinks would not be indispensable except say one or two conveniently located. But in a factory where food preparations were put up they would prove very valuable assets.

Some time ago a large sugar refinery could not lay claim to having one single slop sink. In the scrubbing of floors and cleaning of apparatus, operations that were absolutely necessary to keep the building in proper sanitary condition, the employees had to carry the waste water and pour same into water closets in the toilet rooms, situated at one end of the extremely long building. Scarcely a day passed that a water closet bowl was not broken as a direct result of using the W.C.'s as slop sinks, and several dollars' worth of valuable time was wasted every day in fetching and removing clean and dirty water to and fro. In that one plant a conservative estimate put the loss at from $5,000 to $7,000 annually through not having plenty of slop sinks centrally located. It is needless to say that as soon as this state of affairs was brought to the attention of the management slop sinks were ordered at suitable intervals on each floor of the building, which resulted in a saving of time as well as breakage of W.C. bowls. The latter often entailed unnecessary loss of time on account of the inconvenience to employees requiring to use these conveniences.

There are, however, very few factories in which slop sinks cannot be very advantageously used for some purpose or other. Good superintendents realize that workpeople cannot work to the best advantage without running greater risks of injury when floors are not kept clean, or when they are littered up with stray materials or tools, etc. In some of the best managed plants the floors are kept clean by men specially engaged in cleaning up, and in work that would take up too much of the valuable time of the skilled workman. These men go round the shop all day long picking up things in the various departments.

Wherever cleaning is going on one or more slop sinks are without doubt really indispensable, and the saving that could be effected by their installation should certainly be considered in every factory building, new and old.

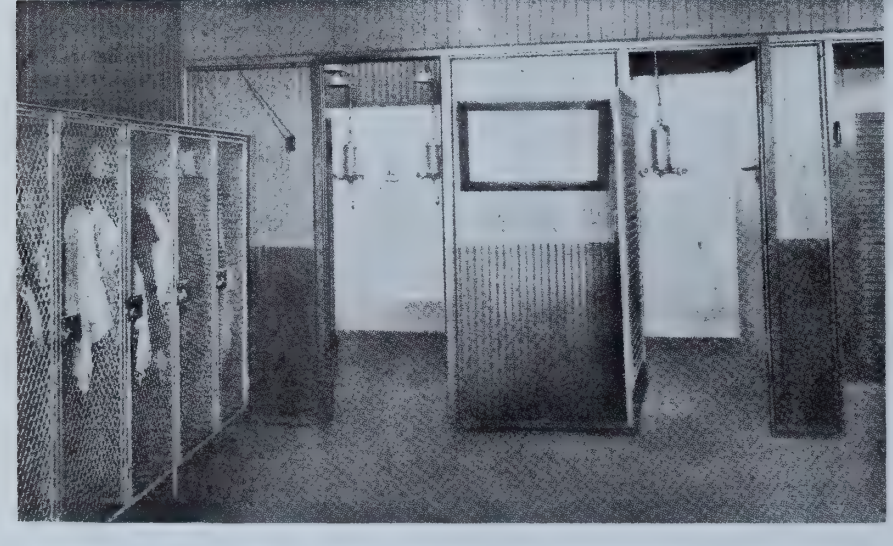
(Continued in next issue)

EDITOR'S NOTE

This series of articles is being published with a view of showing members of the trade how much more efficient labor can be made if sanitary appliances are provided for workmen. The articles are taken from actual experience and can be used as selling talks.

The average factory or workshop is a good prospect for every sanitary engineer. He should cultivate new, bigger and better business among the factory owners by showing how much more efficient workmen will be if adequate toilet and washroom accommodation is provided.

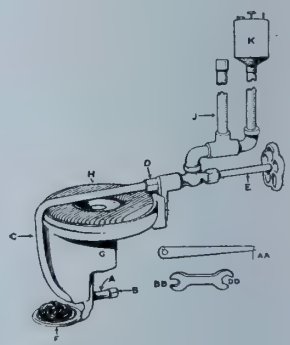
We are indebted to the Standard Sanitary Manufacturing Co., Pittsburgh, for the accompanying illustrations.



Inexpensive yet sanitary lockers and shower bath compartment a suggestion for equipment suitable for small factory.

NEW GASOLINE BURNER

A new and very efficient gasoline burner has been placed on the market recently by the Hotstream Heater Company, Cleveland, Ohio. It is specially adapted to heaters such as regular gas water heaters, using gasoline for fuel in place of gas to heat the water. We are informed that this burner is very economical on fuel, heats water rapidly, can be depended upon to give efficient service all round, and is safe to handle. Full particulars regarding this new burner may be procured from the above firm or from their Canadian representatives, the W. H. Cunningham Co., 183 Church street, Toronto.



New Hotstream gasoline burner.

CAN. NATIONAL EXHIBITION

(Continued from page 19)

if we—every one of us—do not take more interest in pushing our own barrow some other fellow is going to run us all down, lock, stock and barrel with a tank.

We know what many of our manufacturers will say, but it cannot be questioned that far better results would have been accomplished for the trade if a goodly number had taken advantage of such a splendid opportunity to boost their goods. The whole industry had the appearance of being "shelved."

To those who did exhibit belongs the glory, and they certainly excelled in the practical display of their products. There was a certain amount of satisfaction to members of the trade that in some form or other almost every branch of the industry was represented. We wish our readers, and in fact every person engaged directly or indirectly in the trade, to understand that SANITARY ENGINEER is out first, last and always to boost the industry. We do not care to see any resting on the oars these days. It is a time for sowing. Every preparation should be made now or in the very near future for a period of reconstruction. Every manufacturer as well as craftsman and journeyman should be doing something towards meeting conditions that must come when victory over the Hun is declared. We have far too many "Micawbers," and we want more of the "get together and push" spirit. If our present manufacturers persist in holding on to that spirit of suspicion and waiting others will come in. Let us view the situation seriously and take note of the tremendous amount of imports into Canada. The United States shipped one seventh of her total exports into Canada last year, and that has been the average for many years.

If that is so, and we know by statistics given out that it is, has it never dawned upon our manufacturers that Canada is a profitable country in which to establish new industries. Of course it is, provided that our own manufacturers do not take the bull by the horns and conduct their businesses in such a way as to corral some of this export business as well as cater more to home consumption.

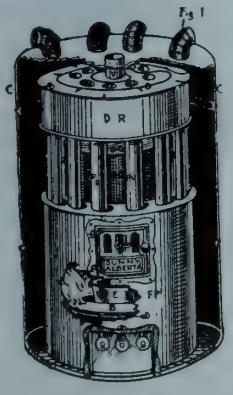
Let us sincerely hope that we will have a different story to tell at the 41st National Exhibition, because we have the goods; we have progressed, but we failed as a whole to "Let our light shine" by not being better represented at the recent exhibition.

New Canadian Patents

No. 183,017.

Albert Mahaffy, Calgary, Alberta, Canada, 19th March, 1918; 6 years. Filed 18th September, 1917. Receipt No. 285,397.

Claim.—In a gas furnace a concentric gas burner with an emergency firepot placed permanently in the centre of the said burner, a ventilated dome above the



183,017. Gas Furnace.

combustion chamber, a drum-shaped radiator with spiral heat travel chambers having radiation flues passing through the said chambers, all combined together and co-operating in a generator of warm air for heating purposes, substantially as in the drawings.

No. 182,896.

The Barco Manufacturing Company, Chicago, assignee of Francis Norwood Bard, Highland Park, both in Illinois, U.S.A., 12th March, 1918; 6 years. Filed 5th January, 1918. Receipt No. 289,419.

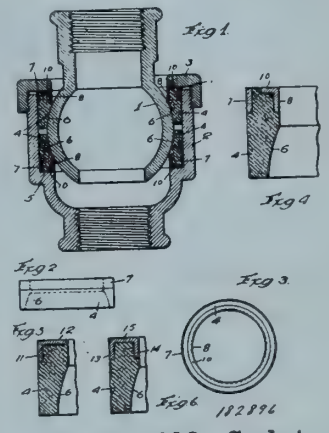
Claim.—1. A gasket for ball and socket joints comprising a hollow cylindrical part of non-metallic material reduced in thickness at one end so as to form a receiving space for the ball, the other end being provided with two metallic pieces, one on the outer face and the other on the inner face, said pieces sunk into the material so that the outer face of one is substantially flush with the outer face of the gasket and the inner face of the other is substantially flush with the inner face of the gasket.

2. A gasket for ball and socket joints comprising a hollow cylindrical part of non-metallic material reduced in thickness at one end so as to form a receiving space for the ball, the other end being provided with two metallic pieces, one on the outer face and the other on the inner face, said pieces sunk into the material so that the outer face of one is substantially flush with the outer face of the gasket and the inner face of the other is substantially flush with the inner face of the gasket, one of said pieces having a part bent at an angle to the main body portion thereof and having its outer face substantially flush with the end of the gasket.

3. The combination with a ball and casing, of a flexible joint, of a gasket of non-metallic material entirely enclosed when the flexible joint is in use and interposed between the ball and casing and thinner at one end than at the other, the ball engaging the inner face of the gasket at the thin end, the other end of said gasket engaging a portion of the casing, said latter end provided with two metallic pieces extending therearound, the metallic pieces engaging the casing and acting to prevent the end of the gasket from becoming distorted.

4. The combination with the ball and casing of a flexible joint, of a gasket of non-metallic material entirely enclosed when the flexible joint is in use and interposed between the ball and casing and thinner at one end than at the other, the ball engaging the inner face of the gasket at the thin end, the other end of said gasket engaging a portion of the casing, said latter end provided with two metallic pieces extending therearound, the metallic pieces engaging the casing and acting to prevent the end of the gasket from becoming distorted, one of said pieces having a portion bent over the end face of the gasket.

5. A gasket for flexible joints comprising a ball, a hollow cylindrical part of



No. 182,896. Gasket.

non-metallic material entirely enclosed when the flexible joint is in use and reduced in thickness at one end so as to form a receiving space for the ball of the joint, a metallic piece connected with the other end of said gasket, said metallic piece having two portions at an angle to each other, one substantially flush with the cylindrical face of the gasket and the other substantially flush with the end of the face of the gasket, a second metallic piece connected with said end of said gasket and extending around the outer face thereof, a portion of the end face of the gasket between said two metallic pieces being exposed and adapted to engage a part of the casing to form a sealed joint.

Market Conditions and Tendencies

Statements Regarding the Prices and Trend of Supplies.

THE MARKETS AT A GLANCE

DECLINES approximating 7c per pound have been made in solder following a further easing away of the market on tin. This is in line with tendencies outlined in SANITARY ENGINEER'S last issue.

The tin market is weak at primary points, and interest centres around the question of price fixing. Almost daily declines are recorded, and this is likely to be reflected here to some extent. Supplies, though not providing a surplus, are equal to demands, and may be termed somewhat easier.

An advance in lapweld steel pipe has become effective. Up to 4-inch goes up 5 points, and from 4½-inch up the advance is 10 points. Difficulty in securing materials for the larger sizes and scarcity of labor are contributing factors; prompt delivery is not being guaranteed, two or three weeks now being usual delivery basis.

A further increase of $1 per 100 pounds has been made in galvanized sheets, and prices are now on a more uniform basis than for many months. Some shipments have come to hand, but these are small compared with outgoing orders, and the situation in regard to supplies is, as a result, worse. Some hope is expressed that Canadian jobbers and manufacturers may be placed on the same basis as those in the United States with regard to securing stocks. If such a condition is permitted, some slight improvement may be looked for.

Supplies of pig iron are very hard to get, and manufacturers of soil pipe are hard pressed to take care of orders. An advance in the price of oakum in the very near future is looked for, present quotations being likely to go up at least 1c per pound. Valves are steady and selling fairly well. Enamelware is very firm, and moving forward in very good quantities.

TORONTO, September 13. — Another advance in galvanized sheets has been made since last issue of $1.00 per 100 pounds, and prices generally are now pretty well stabilized. Wrought iron pipe has been revised to higher levels. Solder registers a substantial decline following further recessions in price of tin and in view of somewhat better supplies. Lead is firm and scarce. Spelter is quiet though firm outside. Business generally is considered fairly good in all lines.

Supplies Small Sizes Good; Market Very Firm

RANGE BOILERS.—The supply of the smaller sizes of range boilers is very good and no shortage is reported. Some of the large boilers are unobtainable and the cutting down of the supply of sheets may curtail output of all sizes materially. However, stocks now are satisfactory and the market rules with a very strong undertone.

	Standard	Extra Heavy
30-gallon range boilers	$14.00	$17.00
35-gallon	17.00	20.50
40-gallon	20.50	24.00
52-gallon	28.00	32.00
66-gallon	37.00	42.00
82-gallon	45.00	50.00
100-gallon	62.00	70.00

Steady Tone Rules in Enamelware Lines

ENAMELWARE.—The steady tone prevailing for some time past is still in evidence. A very fair movement is reported with stocks equal to demands. Prices are firm and held without change:

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Sinks, roll rim, 18 x 30 in., staple	16 80
Closets, oak tank and seat	24 00
Do., enamel iron or white vitro tank	26 00

Stocks Getting Smaller; Market Very Firm

SOIL PIPE, FITTINGS.—Stocks of soil pipe are getting smaller and manufacturers face constantly diminished production. Supplies of pig are as difficult to secure as ever and labor is also hard to procure. Scarcity of raw materials then and increased labor costs are firming factors which must have a bearing on price to be charged. Discounts for the week are unchanged as follows:

SOIL PIPE AND FITTINGS

Medium and extra heavy soil pipe, 6-inch and under	30%
8-inch soil pipe	25%
Medium and extra heavy fittings, and under	40-40 & 2½%

C. I. PIPE FITTINGS.

	Net List
Cast iron fittings	
Plugs	15%
Bushings	18%
Flange unions, standard	Net List
Dart unions, ¼-inch to 2-inch	15%
Do., 2½ in. and larger	6½%
Nipples, up to 4-inch	45%
Do., 4½-inch and larger	40%
Do., running thread 4-in. and under	25%
Couplings, 4-in. and under	35%
Do., 4½ in. and larger	15%

MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittgs., Class A, lb.	.60	.75
Do., Class B., lb. net	.27	.37
Do., Class C., lb. net	.19	.27

Oakum May Advance; Waste Very Firm

WASTE, OAKUM.—A revision in prices of oakum seems likely to become effective during the next few days. It is thought an advance of at least 1c per pound will be made and some definite action may develop any day. In the meantime, prices shown below rule without change. The demand is good and supplies none too plentiful.

A good movement of waste is reported and the market rules with a very firm undertone. Manufacturers intimate that conditions generally warrant higher price levels, but no action in this direction is looked for in the immediate future.

	Per 100 lbs.
Best American	$21 00-$22 00
Clipper, spun	- 21 00
Do., unspun	- 19 50
Plumbers', spun	9 00- 10 50

Market Remains Firm, Unchanged on Valves

VALVES.—There have been no new developments in the market situation during the past couple of weeks. A fair movement only is reported and discounts remain firm and unchanged as follows:

	Discount off list
Ground work	42
Compression work, standard	47
High grade	41
Cushion work	40
Fuller work, standard	45
High grade	38
Basin cocks, No. 0 standard	40
Nos. 1 and 2	40
Bath cocks	50
Flatway stop and waste cock, standard	50
High grade	47
Roundway stop and waste cocks, standard	50
High grade	47
Brass steam cocks, standard add 10%.	
Globe, angle and check valves, standard.	Net
Do., removable seat	Add 5%
Radiator valves, standard	10
Do., removable seat	Net List
Patent quick opening valves	30
Basin Cocks—	

Globe, angle and check valves, standard, medium pressure	20
Radiator valves, standard med. pressure.	30
Radiator valves, removable seat, medium pressure	25

Boiler Tubes Holding Very Firm; Light Supply

BOILER TUBES.—The market remains very firm and no disposition to change prices is in evidence. Supplies are light although recent shipments helped out a situation that was very serious.

BOILER TUBES—	Cold Drawn	Lapweld
1 inch	$36 00	$.....
1¼ inch	40 00	.....
1½ inch	43 00	36 00
1¾ inch	43 00	36 00
2 inch	50 00	36 00
2¼ inch	53 00	38 50
2½ inch	55 00	42 00
3 inch	64 00	50 00
3¼ inch	.....	58 00
3½ inch	77 00	60 00
4 inch	90 00	75 00

Sheets Go Up $1.00; Supplies Grow Smaller

SHEETS, PLATES.—A uniform basis of $11.00 per 100 pounds for 10¾ oz. galvanized sheets has been arrived at, representing an advance in the majority of sources of $1.00 per 100 pounds. The outlook as regards supplies is little brighter and the situation in a general way seems to be that Canadian manufacturers and jobbers are not classed with the United States industries. Whether Canada can be placed on same basis is still to be determined. However, jobbers here intimate that by strict adherence to regulations governing jobbers in the United States they have secured some priority shipments and are given to understand that there is some chance of their receiving further supplies. The feeling prevails that the situation is serious and yet hopeful. Range of quotations on black and galvanized to-day is as follows:

BLACK SHEETS—	Per 100 lbs.		
10 gauge	$.....	$10 00	$.....
12 gauge	.....	9 60	.....
14 gauge	7 95	8 40	8 90
16 gauge	8 00	8 50	8 55
18-20 gauge	8 05	8 30	8 80
22-24 gauge	8 10	8 35	8 85
26 gauge	8 15	8 40	8 90
28 gauge	8 25	8 50	9 00
3-16 inch plate	.....	10 00	.....
¼ inch boiler plate	.....	10 00	.....

Prices shown are for full cases. An extra charge of from 25c to $1 per 100 lbs. is made for less than case lots.

GALVANIZED SHEETS—	
10¾ oz.	$11 00
U.S. 28	10 70
U.S. 26	10 40
22 and 24	10 25
18 and 20	10 10
16	9 95
14	9 85

Prices shown are for full cases. An extra charge of from 25c to $1 per 100 lbs. is made for less than case lots.

Solder Registers Sharp Declines; Lead Products

LEAD AND ZINC PRODUCTS.—A sharp decline in quotations on solder has been made in line with tendencies noted a couple of weeks ago in SANITARY ENGINEER, prices being down from five to seven cents per pound. Lower prices on tin with an easier feeling as regards supplies are mainly responsible for this condition, along with the fact that lead is virtually on a set-price basis. Guaranteed solder is now quoted at from 58 to 60c per pound; strictly from 54 to 58c; commercial from 47 to 49c; wiping from 46 to 48c, and wire at 56c, though some higher prices prevail on the last three lines as noted below. Manufactured lead products remain steady and no immediate change is looked for in these items as long as pig lead holds in its present stabilized state. Range of quotations is given herewith:

Lead pipe, lb.	$0 15	$....
Lead waste pipe, lb.	0 16	....
Lead traps and bends	Net list.	
Lead wool, lb.	0 15½	0 16
Lead sheets, 3 to 3½ lbs. sq. ft., lb.		0 13¼
Lead sheets, 4 to 8 lbs., sq. ft.	0 12½	0 13

Cut sheets, ¾c lb. extra, and cut sheets to size, 1c. lb. extra.

Solder, guaranteed, lb.	0 58	0 60
Solder, strictly, lb.	0 54	0 58
Solder, commercial, lb.	0 47	0 51
Solder, wiping, lb.	0 46	0 55
Solder, wire, lb.	0 56	0 70
Zinc sheets	....	0 26

NEW SCHEDULE OF PRICES ON WROUGHT IRON PIPE

Price List No. 36 (July 5, 1918)

	Black	Galvanized
	Per 100 feet	
Standard Buttweld		
⅛ in.	$ 6 00	$ 8 00
¼ in.	5 22	7 35
⅜ in.	5 22	7 35
½ in.	6 63	8 20
¾ in.	8 40	10 52
1 in.	12 41	15 56
1¼ in.	16 79	21 05
1½ in.	20 08	25 16
2 in.	27 01	33 86
2½ in.	43 29	54 11
3 in.	56 61	70 76
3½ in.	71 76	88 78
4 in.	85 02	105 19
Standard Lapweld		
2 in.		
2½ in.		
3 in.		
3½ in.		
4 in.		
4½ in.		
5 in.		
6 in.		
7 in.		
8 L in.		
8 in.		
9 in.		
10 L in.		
10 in.		

Terms 2% 30 days, approved credit. Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Old Materials Unchanged; Domestic Trade Light

OLD MATERIALS.—Domestic trade is light in old materials and there have been no particularly interesting developments in the market for some time past. Buying prices show no change as noted herewith:

Dealers' Buying Prices

Tea lead	$0 05¼	$....
Heavy lead pipe	....	0 08
Yellow brass	0 12	0 13
Red brass	....	0 21
Light brass	....	0 09½
Heavy zinc	0 05½	0 06
Heavy copper	0 22	0 23
Stove plate, per ton	....	25 00
Old cast iron, per ton	....	30 00

Tin Weakens; Lead, Spelter Held Firmly

INGOT METALS.—A weaker feeling prevails in tin, an improvement in supplies available being noted and primary points recording steady declines, apparently in anticipation of price fixing. Spelter is quiet locally but very firm at outside points. Lead holds without change and antimony is in light demand.

COPPER.—Indications are that producers are able to supply the requirements of the government, but there is little available for outside use. However, practically all is wanted for war work of some kind and little uneasiness in regular channels of trade is noted owing to short supply. Prices remain around 30-32c per pound.

TIN.—A weaker feeling is noticeable in this market and no quotations higher than $1.05 per pound are heard of with some even lower hinted at. Price fixing seems imminent and primary points are declining steadily. Supplies locally seem somewhat easier and even lower price levels may be reached.

SPELTER. — Outside markets are firmer under pressure of heavy demand and apparently limited supply. The situation locally, however, is rather quiet and no change from the 11c per pound price has been made.

LEAD.—The market is ruling firm, but the agreed price of the producers is being held and this stabilizes the market, the question of supply and demand not proving a factor to change prices. Locally quotations hold at 10½ to 11c per pound.

ALUMINUM.—Government requirements continue to absorb supplies and quotations hold unchanged at the nominal figure of 50c per pound.

ANTIMONY.—The demand seems to have eased off somewhat and interest as a consequence lags somewhat. Price holds unchanged at 18c per pound.

PIG IRON.—Production in the States during the three summer months was maintained at a higher level than usual and is expected to improve materially with the coming of cooler weather. Government needs continue to absorb the bulk of the output but the switching of furnaces may result in greater supplies of pig with an easing of the tension somewhat commercially. Results will not be immediate, it is thought, but may work out in a few weeks' time.

Advances Made in Wrought Iron Pipe

WROUGHT IRON PIPE.—An advance in lapweld steel pipe has occurred. Up to 4 inch the increase amounts to 5 points, over 4½ inch the advance is 10 points. The increasing difficulty of securing materials for the large sizes and scarcity of labor are contributing factors. No change in prices on pipe up to 2 inch has been made. Net prices were not available at time of going to press.



CHANGE OF ADDRESS

Readers of SANITARY ENGINEER will be interested to learn that Warden King, Ltd., of 200 Adelaide street West, Toronto, are moving to other premises shortly.

On and after the first day of October the above concern's address will be 130 Simcoe street. All orders and mail will in future need to bear the new address. The manager, Mr. Roy Spence, will be pleased to meet any of their customers and friends at the new address when they visit Toronto on either business or pleasure bent.

INCREASING PRODUCTION

No one appears to take more interest in his "daddy's" work than does Master W. J. Clifton, son of W. F. Clifton, heating engineer, of Brock avenue, Toronto. The little fellow is seen in the accompanying view "doing his bit" with the stocks and dies at the age of two years. As husky as his dad, he believes in doing a good job and has weight for his age. SANITARY ENGINEER just happened to call round at the establishment of Mr. Clifton, and seeing his son right on the job took the opportunity of "snapping" him. Many of the readers of SANITARY ENGINEER will recall the item announcing the "Stepping on the map" of Master W. J., and we are looking forward to the day when we will have a new subscriber to our paper.

W. F. Clifton Sen. is one of the coming men in the heating engineering profession, and takes a great pleasure in his work for the work itself, following the occupation with more than ordinary interest. Like many a young member of the trade, he is building up quite an enviable reputation, and many are the heating systems installed by Mr. Clifton that will give good service to the owners for many, many years.

LIEUT. ALLAN KEITH WOUNDED

Mr. Alex. Keith, 199 Lyndhurst ave., has received word that his son, Lieut. Allan Keith, has been wounded in the arm. Lieut. Keith, who was the secretary of Keith's Limited, was formerly a student at St. Andrew's College. He went overseas with the 11th Battery and has been overseas for nearly two years. He was well known in athletic circles, taking a prominent part in many athletic activities. He is married and has two children. His brother, Major Forbes Keith, is also overseas.



Master W. J. Clifton one of Toronto's youngest heating engineers, the 2 year old son and heir of W. F. Clifton Heating Engineer, Brock Ave., Toronto.

BUILD WARMER HOUSES IN TORONTO

City Architect Pearse is making a study of the possibilities of so amending the building by-laws as to require more attention to the question of warmth in the building of houses. Cost of building material, however, enters into the problem to a large extent.

No doubt this move on the part of the Toronto City architect is one in the right direction. SANITARY ENGINEER has taken more than an ordinary interest in the problem of heating houses. We believe that if houses were better built, thus making houses less difficult to heat, that thousands of tons of coal could be saved, and in spite of the fact that such a class of buildings would cost a great deal more to erect, there is no doubt but that the extra cost would be proven in practice as justified.

MAY PROVIDE COMFORT STATION AT WATERLOO PARK

At a regular monthly meeting of the Waterloo Park Board held recently it was decided to take steps to provide a comfort station at the park, the present accommodation having been condemned by the Board of Health. A committee, composed of Messrs. Wells, Hughes, McIntyre, and Smith was appointed to take the matter in hand and secure estimates of its cost, etc. It is likely that the proposition will be placed before the ratepayers at New Year's for their endorsation.

Commenting upon the above, we are pleased to see this move made by the Waterloo Park Board. Readers of SANITARY ENGINEER will recall that Waterloo has a very modern plumbing by-law in force considering the size of the town. This by-law was reproduced in SANITARY ENGINEER some years ago.

NEW BULLETIN ON TRAP RATINGS

A splendid little booklet has just been published by the George W. Cole Ltd., 2002-4 Dundas street West Toronto. It deals with the subject of "Trap Ratings" and describes how steam traps should be rated from a practical standpoint. Many of the pitfalls encountered by heating engineers are cited. The booklet can be procured upon writing to the above for Bulletin 10.

The above concern have also a companion, Bulletin No. 9, which deals with the problem of boiler feeding, a subject of interest to every heating engineer, every line contains splendid matter, and we would advise our readers to procure the two bulletins at the same time.

EXHIBIT AT TORONTO FAIR

At the Canadian National Exhibition in Toronto the Department of Soldiers' Civil Re-Establishment had an exhibit representing all phases of its work. Disabled men were shown engaged at various occupations from which it might be imagined injured men would be debarred, and some of the products of their work were prominently displayed. Photographs of the various shops and classes in which the men were trained, photographs of the sanatoria and hospitals in which they were restored to health, and some of the up-to-date equipment of those places were found in the department's exhibit.



BUFFALO CRAFT VISITS TORONTO

A Splendid Gathering Despite the Inclemency of the Weather. Visitors Take in the Exhibition and Toronto Craft Turn Out With Flotilla of Autos to Meet Them and Drive the Buffs Around the City

THERE seems to be a no mean order of attraction in Toronto for the Buffalo Master Plumbers and their better halves. So much so that on August 28 upwards of 50 members and their wives paid a visit to the Queen City, and were entertained by the Toronto Society of Domestic Sanitary and Heating Engineers.

The latter turned out with a flotilla of autos to meet the visitors, and escorted them to the now famed hostelry, the Isabella Hotel, noted for the fact that Bill Schultz, the proprietor, is an ex-member of the Toronto craft.

The party arrived via a Niagara steamboat at the Yonge street wharf midst a heavy downpour of "wetness," "wrong kind, said not a few." The Toronto boys rushed the visitors off to the Isabella Hotel, where first of all a photo of the group was taken, after which a sumptuous repast was partaken of. After lunch the automobiles were brought into commission. It having been first arranged to drive the party out to the Leaside Aeroplane camps, but owing to the inclemency of the weather this item of the programme was called off and a drive round the city was indulged in instead.

Before embarking for the auto ride the crowd got together and sang several patriotic songs, including the "Star Spangled Banner," etc. The hotel was fittingly decorated with flags of the Allies, not forgetting of course good "Old Glory." Each visitor was furnished with a badge of blue and gold. Secretary Frankland always does things double, even to getting in twice on the photograph, and as regards his accomplishments at this event, he more than excelled any of his previous efforts

The entertainment committee, H. Farthing, Roy Belyea, Secretary Frankland, Geo. R. Baker and H. Weinraub, then rearranged the programme, and after the drive through the city the party did justice to their evening repast.

Some went to the Exhibition despite the weather and others took in "Hearts of the World" at the Massey Hall, but most of the visitors postponed the exhibition event until the following day.

Thursday was a rather better day and most of the ladies did a little shopping and had a day almost to themselves; the evening saw most taking in the Exhibition, and all expressed great surprise at the wonderful display. Friday morning again saw the ladies making the rounds of some of the big stores and preparing for their return.

A number of the Toronto craft, including the able host, Bill Schultz, and his good lady, together with Secretary Frankland, were on hand to wish the party a safe return home. The party leaving Toronto at 2 p.m. Friday by one of the Canada Steamship Line boats.

NEW LAVATORY ACCOMMODATION AT EXHIBITION

It is always the policy of SANITARY ENGINEER to give credit when credit is due, and of course to severely criticise when such is warranted.

For a number of years SANITARY ENGINEER has felt keenly about the condition and poorly kept public comfort stations at the Toronto Exhibition. In looking over the new additional lavatory accommodation provided this year by the directors, we feel that there have been improvements of a high order. The layout of the fixtures and style are very serviceable, and what is more, the older comfort stations were kept much cleaner than was the case in previous years. We hope in the near future to be able to procure photographs of the new additions and to have same reproduced in SANITARY ENGINEER. Another piece of interesting news to readers is that one of the directors promised to do all in his power to have the public comfort station emblem referred to in SANITARY ENGINEER some time ago adopted by the city council, this too, is a good move.



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published--Description of Jobs Done or Shop Kinks Are Also Invited.

QUESTION BOX

How to Heat Kitchen From Coil in Furnace as Well as Range Boiler in Bathroom

Editor, Sanitary Engineer: Kindly let me know how to connect a radiator up so as to heat a kitchen. The range boiler is 30-gallon capacity and is situated in the bathroom above the kitchen. A coil will be in the Kelsey Warm Air furnace in the basement.

The town water pressure is from 60 to 70 pounds, and the kitchen is 12 x 12 with 8 foot ceiling.

W. J. S., Ontario.

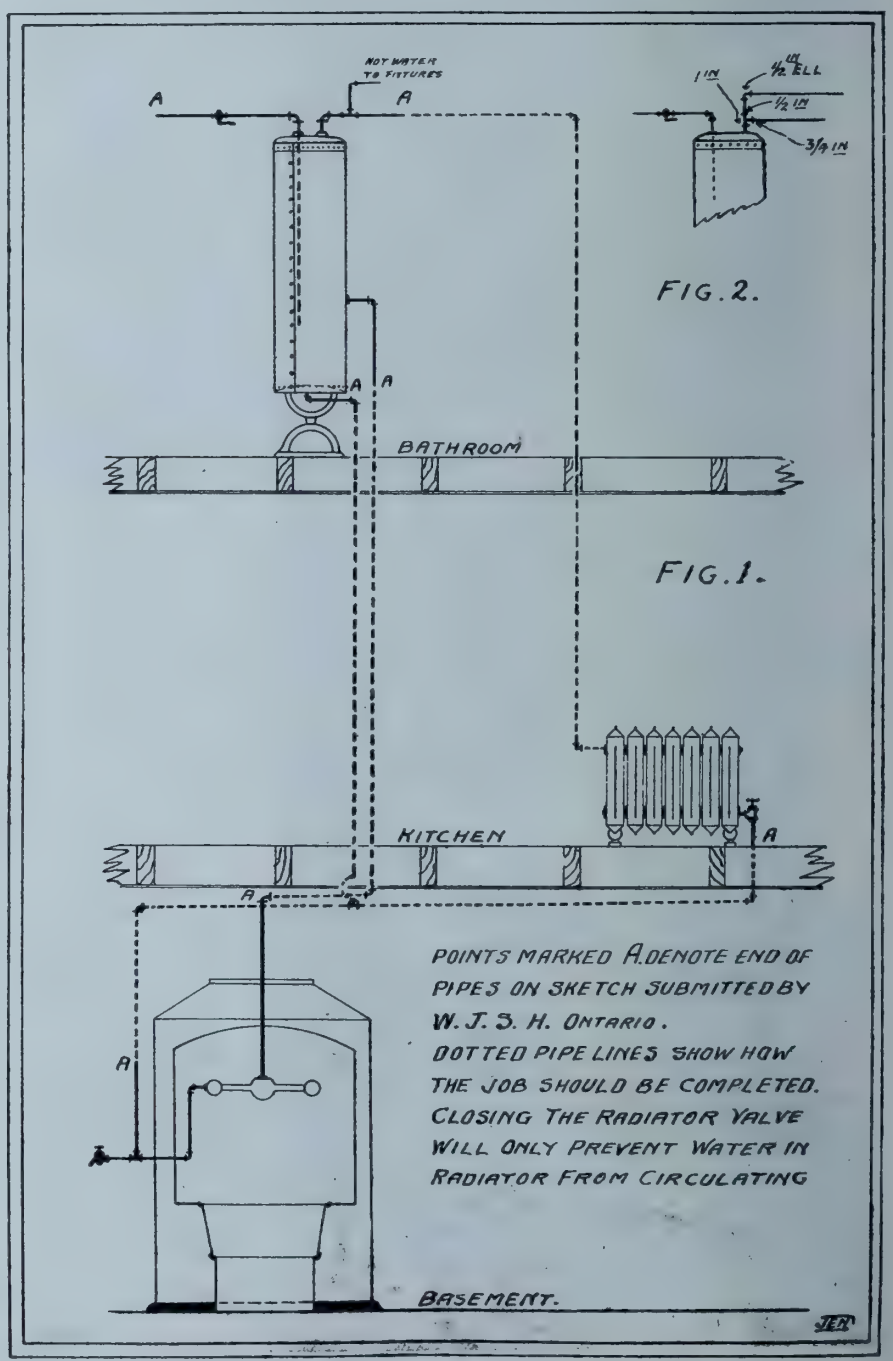
Regarding the way to connect up a radiator to a coil in a furnace as well as a range boiler, the latter being in the bathroom, we show in Fig. 1 how this can be done, but as to size of radiator we cannot very well advise because we do not know what amount of heating surface there is in the coil, nor do we know the size of the bathroom, or the amount of water that is likely to be used for domestic purposes.

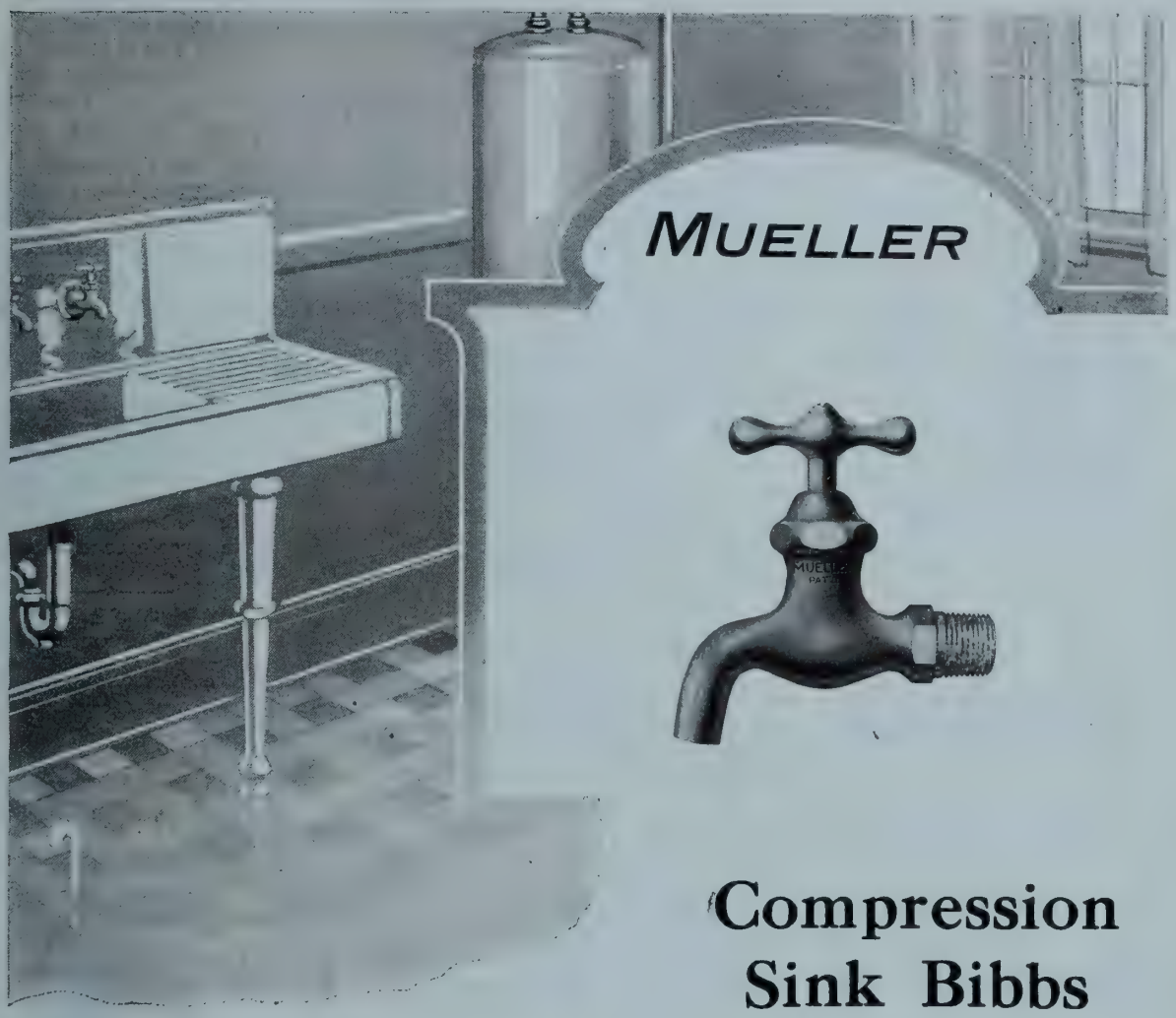
There is very little information that can be given regarding size of radiator necessary for such a job because it all depends upon the amount of water used from the range boiler. The most popular size however is one about 27 to 36 square feet, and the best type is a wall radiator, three or four 9-foot sections connected as shown, though we have shown a regular floor radiator. We simply reproduce the type given by our enquirer.

Regarding size of connections at the range boiler we would advise that there be a 1-inch short nipple placed into the boiler on the hot water outlet, then screw on a 1 x ½ x ¾ galvanized T, the ¾ centre to be used for the radiator and the ½-inch outlet for the domestic supply. Fig. 2 shows how these connections should be made.

Regarding the coil connection at the furnace, we would advise that 1-inch pipe be used to the elbow marked A at the top of furnace, this elbow to be a 1-inch by ¾-inch, then use ¾-inch pipe

Continued on page 32





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SARNIA CANADA

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POSSIBILITIES AHEAD OF THE GAS INDUSTRY

Continued from page 15

the continued pursuing of this course means (it is as certain as anything mundane can be) disaster—disaster, not precipitate, but gradual decline, from which there will be little chance of rescue owing to the well-defined progressive policy and advancement of competing industries."

"What we are lacking to-day in the gas industry is strong and concentrated leadership. Let us be plain; it is the time for plain words." . . .

From here on Mr. King, in his editorial, brings out the vital need for men who have made a success in the industry, taking the leadership—acting protagonists in the cause of the industry, and he states it is better the facts should be recognized and accepted as it will enable us to get on firm ground. I would advise the members of this association to read Mr. King's editorial in full.

Mr. King further states, "Let the gas industry show at once, by forming a strong and live committee to take up this matter, that there are within it men who feel the responsibility of the present position in its relation to the future, and who want that future to be a striking testimony to their alertness and statesmanlike handling of the position of to-day."

We must endeavor to disabuse the public mind of the belief that gas is a back number and that electricity will sooner or later supplant it for general purposes, and it is up to each one of us here assembled to do what we can, through public advertisements or through spoken words, or otherwise, to educate the people to the importance of gas as a public benefactor.

It is really remarkable how many electrical engineers there are who have lately come forward with statements to the effect that gas has a useful place in the future of our country, and that there is not an unlimited supply of electricity to take care of the requirements for every purpose in which gas is now used.

We ought to make every effort to see that no statements appear in the public press that may be detrimental to the good of our industry, and whenever such harmful publicity does appear we ought to, individually, take on our own shoulders the task of refuting such statements. Good work has been done in the past by the "Harmful Publicity Committee" of the late National Commercial Gas Association in this regard, and we trust that the newly-formed American Gas Association will go on with the good work. The writer, as secretary of the Canadian Gas Association, will be pleased at any time to receive notice of any harmful publicity that may be published in the various journals and he will make an endeavor to reply to the same. The press agencies connected with the electrical industry are continually busying themselves with supplying the press with the many and varied services in which electricity is now being used, and this association ought to be doing something along the same lines.

The truth that gas is coming into its own goes without saying with those who know the situation, and a few extracts from reports by eminent authorities in this connection may be of interest at this time.

That gas for illuminating purposes has not as promising a future as electricity may be granted, but still there are thousands and hundreds of thousands of homes throughout the country that will be a long time throwing out gas because of the fact that there is not yet, and will not be for many years, sufficient electrical energy to supply the many local and general lighting requirements.

Electricity as a heating agent, whether used for cooking, baking, ironing, and for many other purposes, is no longer an experiment, but would be an admitted success, as far as doing the work is concerned, if it were not for the fact that the use of electricity for such purposes is nothing short of a national crime when consideration is given to the fact that this same electricity used as motive power would do in many cases 50 and 100 per cent. more efficient and useful work.

Many people are looking forward, as said before, to the days when electricity will supplant the use of coal, gas and other fuels in the heating of their homes, and in accomplishing many other heating operations, but using the words of Mr. Arthur V. White, consulting engineer, Commission of Conservation, Canada, "That the sooner the public mind is disabused of the idea that, as a heating agent, electric energy can be made an adequate substitute for coal for the citizens of Canada and other countries, the better it will be for all concerned." He states further, that "Its economical use is in the direction of the development of power."

An editorial on electric heating, published in the April, 1918, issue of "Industrial Canada," states that "It will come, doubtless, as a surprise to many, that in the opinion of so able an engineer as Mr. Arthur V. White of the Conservation Commission, the application of electric energy in the production of heat is a very much exaggerated possibility. We have for some time had a sort of a pleasant feeling that sooner or later means would be devised for the economic utilization of the electric current in heating houses. The fear that the coal supply would be exhausted within a certain number of years was offset by the belief that long before that time we would have become quite independent of coal. Mr. White, of course, doesn't say that eventually means will not be found to produce a suitable substitute for coal. The point is, that we cannot rely on our water powers to do the trick, they will be adequate for power purposes but not for heating purposes, and until some other source of electrical energy is discovered we must do our best with the present arrangements."

A good many of our members will no doubt remember the discussions that took place at the first general meeting of the Canadian Society of Civil Engineers, which was held in Toronto on March 22, 1918, when it was quite evident from a digest of the papers read and the discussions that took place between the engineers there present, and representing every branch of the fuel industry, that electricity was doing the country a great service whenever it was utilized for power purposes, but when used as a heating agent was doing the country a national injustice.

(To be continued)

QUESTION BOX

Continued from page 30

up to range boiler. Next use 1-inch pipe up to the T branch, and use a 1 x ¾ x ¾ T for this connection. If it is found that the radiator robs the range boiler and becomes hot at the expense of the latter the valve on the radiator should be closed slightly until the heat becomes distributed satisfactorily, or in the evenings when very little hot water is used the valve could be opened full, thus giving preference to the radiator. —Editor.

HAD NO SIDEWAYS

An old Englishwoman of exceeding stoutness was making efforts, not immediately successful, to enter the rear door of an omnibus. The boy on the box leaned down and cried genially: "Try sideways, mother, try sideways!"

To which the old woman responded: "Lord bless ye, John, I ain't got no sideways!"



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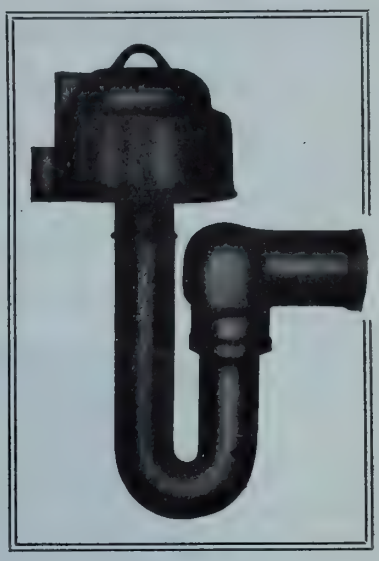
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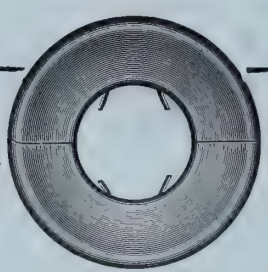
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Canadian Brass Co., Ltd., Galt, Ont.
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Mfg. Co., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Standard Sanitary Mfg. Co., Ltd., Toronto.

Country Residence Equipments.
Hurley Machine Co., Toronto.
Empire Mfg Co., London.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

Damper Regulators.
C. A. Dunham Co., Ltd., Toronto.

Drainage Fittings.
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.
H. Mueller Mfg. Co., Sarnia.

Drinking Fountains.
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Mueller Mfg. Co., Ltd., H., Sarnia.

Ejectors, Steam.
James Morrison Brass Mfg. Co., Ltd., Toronto.
Kerr Engine Co., Walkerville.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

Enamelware.
Amherst Foundry Co. Ltd., Amherst, N.S.
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Standard Sanitary Mfg. Co., Ltd., Toronto.
Port Hope Sanitary Mfg. Co., Ltd., Port Hope.

Electric Pumping Machinery.
Empire Mfg. Co., Ltd., London and Toronto.
Hurley Machine Co., Toronto.
H. Mueller Mfg. Co., Sarnia.

Fans
Bicalkey Fan Co., Buffalo.

Fittings.
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

Flushometers.
Canadian Brass Co., Ltd., Galt, Ont.
Canada Metal Co., Ltd., Toronto.
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Standard Sanitary Mfg. Co., Ltd., Toronto.

Floor and Ceiling Plates.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Beaton & Corbin Mfg. Co., Southington, Conn
Canadian Wolverine Co., Ltd., Chatham.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
James Morrison Brass Mfg. Co., Ltd., Toronto.
Steel & Radiation, Ltd., Toronto.

Gasoline Engines.
Empire Mfg. Co., London.

Gas Water Heaters.
Empire Mfg. Co., Ltd., London and Toronto.
Holstream Heater Co., Cleveland.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Pittsburg Water Heater Co., Toronto.
Rudd Manufacturing Co., Toronto.

Generators.
James Morrison Brass Mfg. Co., Ltd., Toronto.

Heaters.
Lord & Burnham Co., Toronto
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal and Toronto.

Lead.
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Hoyt Metal Co., Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

Mixing Valves.
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Port Hope Sanitary Mfg. Co., Ltd., Port Hope.

Monkey Wrenches.
Trimont Mfg. Co., Roxbury, Mass.
G. & W. G. Gummer, Ltd., Rotherham, England

Packing.
Canadian Wolverine Co., Ltd., Chatham.

Packless Radiator Valves.
Kerr Engine Works, Walkerville.

Pipe and Radiator Hangers.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Beaton & Corbin Mfg. Co., Southington, Conn.

Pipe, Black and Galvanized.
Canadian Tube & Iron Co., Ltd., Montreal.
Consumers Metal Co., Ltd.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.

Pipe Cleanser
Chamberlain Desolvo Co., Ltd., Toronto.
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London and Toronto.

Pipe Cutters.
Borden Canadian Co., Ltd., Toronto.
Trimont Mfg. Co., Roxbury, Mass.

Pipe Joint Compounds.
Canadian Wolverine Co., Ltd., Chatham.
James Morrison Brass Mfg. Co., Ltd., Toronto.
Canadian H. W. Johns-Manville Co., Toronto.

Pipe, Soil, and Fittings.
Anthes Foundry Co., Toronto and Winnipeg.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Toronto Hardware Mfg. Co., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.
Warden King, Ltd., Montreal.

Pipe Threading Tools and Machinery.
Borden Canadian Co., Toronto.
John Hall & Sons, Ltd., Brantford.
A. B. Jardine & Co., Hespeler.

Pipe Wrenches.
Borden Canadian Co., Toronto.
Trimont Mfg. Co., Roxbury, Mass.

Porcelain Ware.
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
L. Wolff Manufacturing Co., Chicago.

Pumps.
C. A. Dunham Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Hurley Machine Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brassfounders & Engineers, Ltd. Cornbrook, Manchester, England.
R. MacDougall & Co., Ltd., Galt.

Radiators.
Lord & Burnham Co., Ltd., Toronto.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.

Radiator Foot Rests.
Beaton & Cadwell Mfg. Co., New Britain, Conn.

Radiator Traps (Steam).
H. Mueller Mfg. Co., Sarnia.
Canadian H. W. Johns-Manville Co., Toronto.
C. A. Dunham Co., Ltd., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

Range Boilers
Toronto Hardware Mfg. Co., Toronto.

Reducing Pressure Valves.
C. A. Dunham Co., Ltd., Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

Roof Flanges and Flashings.
Canada Metal Co., Toronto.
Simplex Manufacturing Co., Chicago.

Rubber Goods
Canadian Consolidated Rubber Co., Ltd., Montreal.

Septic Tank Valves and Syphons.
Anthes Foundry Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

Solder.
Canada Metal Co., Ltd., Toronto.
Hoyt Metal Co., Toronto.

Second-Hand Pipe
Consumers Metal Co., Ltd.

Steam Specialties.
Dart Union Co., Ltd., Toronto.
C. A. Dunham Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Kerr Engine Co., Walkerville, Ont.
James Morrison Brass Mfg. Co., Ltd., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

Steam Traps.
Geo. W. Cole Co., Ltd., Toronto.
C. A. Dunham Co., Ltd., Toronto.
United Brass Founders & Engineers, Ltd., Cornbrook, Manchester, England.

Smoke Test Machines.
James Morrison Brass Mfg. Co., Ltd., Toronto.

Testing Plugs.
James Morrison Brass Mfg. Co., Ltd., Toronto.

Tools.
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Trimont Mfg. Co., Roxbury, Mass.
Williams, J. H., & Co., Brooklyn, N.Y.

Unions.
Canada Metal Co., Ltd., Toronto.
Dart Union Co., Ltd., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

Vapor Heating Systems.
C. A. Dunham Co., Ltd., Toronto.

Vitro Tanks.
Galt Brass Co., Ltd., Galt.

Vacuum Systems of Heating.
C. A. Dunham Co., Ltd., Toronto.

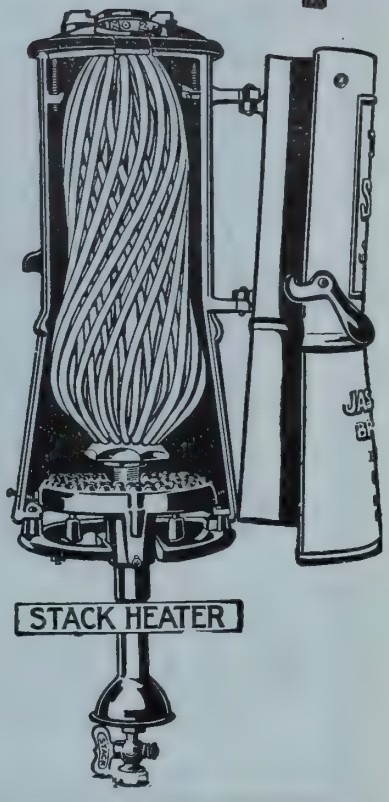
Ventilators
Bicalkey Fan Co., Buffalo.

Water Supply Systems.
Empire Mfg. Co., Ltd., London and Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Hurley Machine Co., Toronto.

THE JAS. MORRISON BRASS MFG. CO. LIMITED TORONTO, ONT.

TRADE MARK J.M.T

The Copper Tubes Rising Almost Perpendicular-

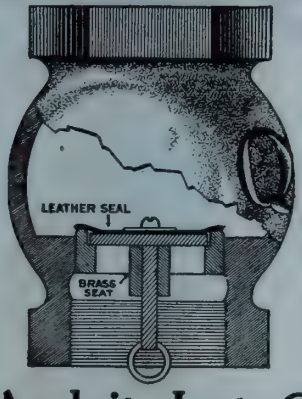


break the water up into small columns entirely surrounded by heat from the gas flame. Rapid circulation carries the water out of the heater without giving time for the deposit of sediment, thus preventing the tubes from being coated and losing their efficiency.

Stack Heaters operate so simple that anyone can quickly grasp the principle on being shown the interior of this superior heater.

Stack sales are quick sales and permanent sales—always.

James Morrison Brass Mfg. Co., Limited
93-97 Adelaide Street West - TORONTO



This is a "Q" Foot Valve

And it Just *CAN'T* Leak

There are more pump troubles caused by "leaky" valves than from all the wear and tear which occurs in the average life of a pump.

The "Q" valve will overcome all priming troubles, and water once raised above it, through the suction line, will not leak out.

If you want the pumps you instal to give maximum, you will require to use the only valve on the market that JUST CAN'T LEAK.

Made in sizes from 1 to 8-inch.

R. MACDOUGALL CO., LTD
GALT., CANADA

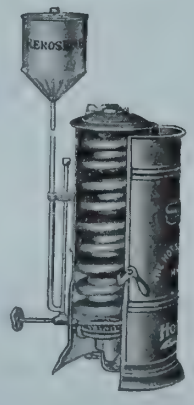
The Hotstream HEATS INSTANTLY TRADE MARK REG. WATER HEATER

Kerosene Water Heater

Here is a REAL kerosene heater. Heaters as FAST and HOT as gas. Patented wickless burner generates its own gas and throws a clean, powerful, odorless, blue flame.

Will run over 12 hours on a gallon.

Burner absolutely **noiseless.** Send for descriptive folder.



Also Made With Cast Sections

The Hotstream Heater Co.
"Makers of heaters that heat"
CLEVELAND, OHIO
W. H. CUNNINGHAM & CO., 183 Church Street, TORONTO
Canadian Representatives

Over 50,000 Daisy Hot Water Boilers Now In Use—Are *You* Selling Your Share?



Daisy Hot Water Boilers are easiest to sell because they have an established reputation for exactly meeting the requirements of the modern home.

Every Daisy you instal will help build bigger business by bringing repeat orders for installation in neighboring homes later.

IMPORTANT NOTICE

We desire to inform our readers that on and after Oct. 1st our address will be 136 Simcoe Street, Toronto.

WARDEN KING Limited, Montreal

BRANCH OFFICE: 200 ADELAIDE ST. W., TORONTO

WROUGHT PIPE

BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES Black and Galvanized All Sizes

Ask your jobber for CT Brand

CANADIAN TUBE & IRON CO., LIMITED

Montreal Works: Lachine, Can.

PIPE AND THE PUBLIC WELFARE

By R. C. McWANE

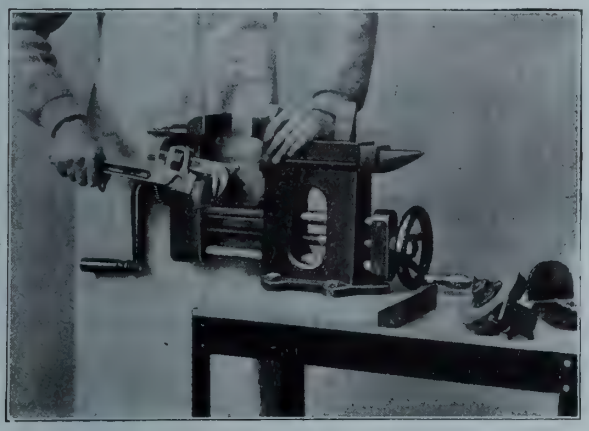
A Book Just Off the Press

Every sanitary engineer should be the possessor of this book. It deals with pipe-making of all kinds, cast iron, wrought iron, steel, wood and tile pipe. It is valuable because it gives the users of pipe a true idea of how pipe lasts under various conditions when in service.

Price $1.00 Postpaid

MACLEAN PUBLISHING CO., LIMITED, Book Dept., University Ave., TORONTO

THE
Stewart Handy Worker
An Equipment All in One



WEIGHS 90 POUNDS

The Equipment Comprises——

A Pipe Vise
A Bench Vise
A Bench Grinder
A Two-Speed Drill
A Hardy Cutter
An Anvil

It's not a toy. It's a real combination of practical tools for practical people.

Write for full particulars.

CHICAGO FLEXIBLE SHAFT COMPANY
12th Street and Central Avenue
Department H.W. CHICAGO, U. S. A.



Every Winter There Is Trouble With Frozen Drains

The use of fire in thawing pipes is dangerous. **Desolvo** generates heat by mixing with cold water.

There is nothing quicker or more efficient in clearing choked drains, waste and soil pipes.

Handled by every jobber in Canada.

THE CHAMBERLAIN DESOLVO CO.
LIMITED
110 Church St., Toronto
General Offices - - - - - - PITTSBURGH, PA.



JOHNS-MANVILLE SERVICE
COVERS THE CONTINENT

Johns-Manville Radiator Trap

Just a Ball— That's All

Often it's the smallest fitting that kicks up the most trouble. Either it is hard to connect up, or the adjustment is delicate, or some little part keeps wearing out.

So it will pay you to get acquainted with the Johns-Manville Radiator Trap — because it is tall simplest on the market. Just three parts—body, bhe and connecting union; only one moving part—the hollow ball. It regulates itself, no nice adjustments necessary, no chance of tempering.

Supplied for straight or angle connections—right, left, or bottom outlet. Pamphlet and prices on application.

The Canadian H.W. Johns-Manville Co., Ltd.
Montreal Toronto Vancouver Winnipeg
Hamilton London Ottawa





PIPE THREADING AND CUTTING TOOLS

One Man Can Thread up to 12 Inch.



Cuts Without Burring

You cannot afford to expect your men to make horses of themselves. If they did they could not keep it up. Our tools save time, do better work and makes life worth living for your men.

No. 1 cuts from ⅛″ to 1″
No. 5 cuts from ½″ to 2″
No. 10 cuts from 2½″ to 4″
No. 15 cuts from 4″ to 6″

Ratchet	Geared
No. 6—¼″ to ¾″.	No. 41—2½″ to 4″.
No. 25—1″ to 2″.	No. 61—2½″ to 6″.
No. 26—1″ to 2″.	No. 80—4½″ to 8″.
	No. 90—9″ to 12″.

The Borden-Canadian Company
TORONTO, CANADA

"JUST ONE MINUTE"

To call your attention to the Famous B & C Floor and Ceiling Plates.
Our No. 15 style narrow flange designed for the Canadian trade.

One of many styles



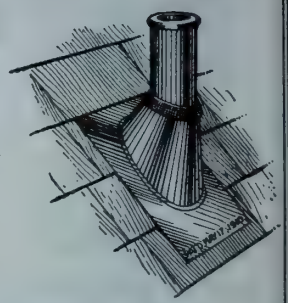
No. 15

Handsomely nickel-plated or plain Sizes ½ to 2″

Stock now carried by our Canadian Representative
W. H. CUNNINGHAM & CO., 183 Church St., TORONTO, Can.
THE BEATON & CORBIN MFG. COMPANY
Southington, Conn., U.S.A.

The SIMPLEX Adjustable Roof Flange

Fits any roof from ½ pitch to flat—just slide it down the pipe and it will conform with the pitch of the roof.



Trade Price 2″ $1.00 4″ $1.15

Made in all sizes—For sale by nearly every jobber
Simplex Mfg. Company - Chicago, Ill.
183 Church St., TORONTO, ONT.
Canadian Representative: W. H. CUNNINGHAM & CO.,

Salesmen Wanted

Men who have worked up a connection with the trade are far more valuable to you than inexperienced men. The way to locate them is through your trade paper because wide-awake salesmen read it. When in need of salesmen use the Want Ad Page; the rates are 2 cents per word first insertion and one cent per word for each subsequent insertion, a charge of 5 cents extra is made for Box Number to cover cost of forwarding replies.

Second-Hand Pipe

1-2″ to 4″

Black and Galvanized

Send us list of your requirements

Consumers Metal Company, Limited
14 St. John Street MONTREAL
Works: LACHINE, QUE.

"HAUSE" PIPE JOINT CEMENT

For steam, water, air, oil, gas, gaskets, etc. The cement that cements. Sets like gum. Allows no leaks.

The Great Value of "HAUSE PIPE JOINT CEMENT" lies in its peculiar chemical properties which permits of its hardening and expanding after the joints are made up. In making up joints it has the same effect as a lubricant on the best graphite, and while the joints may be made and broken readily, a perfectly tight joint is maintained at all times. Comes in 1-lb., 5-lb., 15-lb. 25-lb., 50-lb. cans, 100-lb. barrels. Manufactured in ready mixed and powder form. Ask your jobber for prices, or write us direct.



Manufactured in Ready Mixed and Powder Form.

Made in Omaha, Neb., U.S.A., by

Chas. F. Hause Mfg. Co., Inc., Omaha, Neb.
Canadian Representative: Empire Mfg. Co., Ltd., Toronto.

THE BICALKY VENTILATOR

It's a real little wind engine



Is a positive suction fan that ventilates

The "Bicalky" will dispense with all auxiliary heaters on local ventilation systems.

It is, as far as we know, the most scientifically constructed, self-propelled fan ventilator on the market.

Write us for full particulars.

BICALKY FAN CO.
BUFFALO, N.Y.
Canadian Sales Agents:
J. S. Chapman & Company
89 Jarvis St., Toronto

Dart Unions Are Strong and *Permanent!*

DART



A permanent, rust-resisting metal at a point where the joint is made—this is the secret of the longevity of Dart Unions.
Remember the slogan, "Bronze to Bronze at the Joint."

Your jobber sells them.



Manufactured by

DART UNION CO., LIMITED
TORONTO

There Are Lots of Gate Valves

Advertised and Sold



but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.
Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.
Approved by the Fire Underwriters' Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario



EVERY FITTING TESTED

EVERY TANK GUARANTEED

More Than 350,000 VitrO *No-Trouble* Tanks Are Now In Use!

Simply because we have guarded every point, every feature in the make-up that spells lasting service, we have succeeded in making VitrO No-Trouble Tanks universally famous, and used from coast to coast.

There are now over 350,000 in use

Join us in our success by specifying VitrO No-Trouble Tanks when placing your next order of goods with your jobber.

Galt Brass Company, Limited

Galt, Canada

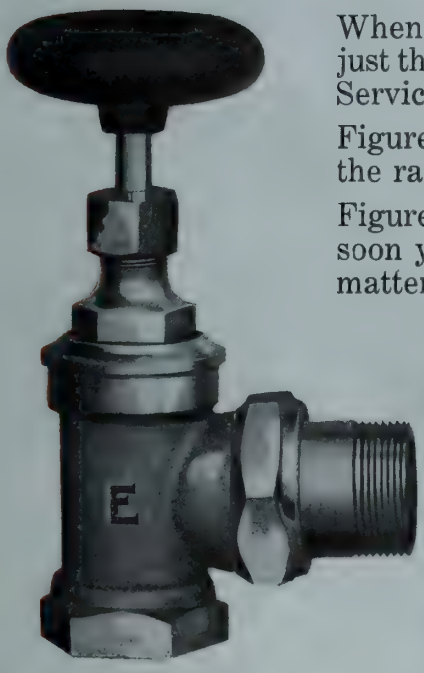
SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

Vol. XII. Publication Office, Toronto, October 1, 1918 No. 19

EMPIRE RADIATOR VALVES

ARE MADE JUST RIGHT



When installing that job of hot water or steam radiation, just think of all the good points of Empire Radiator Valve Service.

Figure out which would be the cheapest in the long run, the radiator valve with or without a union coupling.

Figure out delivery, and find out for yourself just how soon you can have deliveries made. That's a very vital matter these days. But remember, we have the plant.

EMPIRE

STAND E FOR

EFFICIENCY OF SERVICE



We know we have told our customers many things about our plant, as well as our product. Yet we have no other alternative but to remind the members of the trade just how we are situated these days.

We can make deliveries from stock, and we operate the largest exclusive plumbers' brass plant under the British Flag. It is at your service, too. One thing more—when you buy radiator valves or any other line of brass goods, look for the Empire. It's on every piece.

Empire Manufacturing Co., Limited

LONDON TORONTO

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While



A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for BEAVER BRAND CAST IRON ENAMEL WARE

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

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Monarch Brass Mfg. Co., 71 Brown St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes, 120 Lombard St., Winnipeg

CANADIAN CONSOLIDATED RUBBER CO. LIMITED
DOMINION
RUBBER
SYSTEM
AND ASSOCIATED COMPANIES

BELTING - HOSE - PACKING

The Dominion Rubber System has established a reputation for making *good* rubber products. That applies to Footwear, Tires, Raincoats, Druggists' Sundries or Mechanical Rubber Goods. In each case the quality is second to none and the workmanship of the best.

That is particularly true of our Mechanical Rubber Goods. Dominion Rubber System Belts and Belting, Hose and Packing, etc., for industrial use, "stand up" and do the work expected of them. In these lines, quality and service have been linked together to such a degree that absolute satisfaction is guaranteed.

If you have not proved the satisfactory service of Dominion Rubber System Belting, Hose and Packing, write to our nearest branch and ask for one of our experts to discuss your Belting, Hose or Packing problems with you.

Canadian Consolidated Rubber Co.
Limited

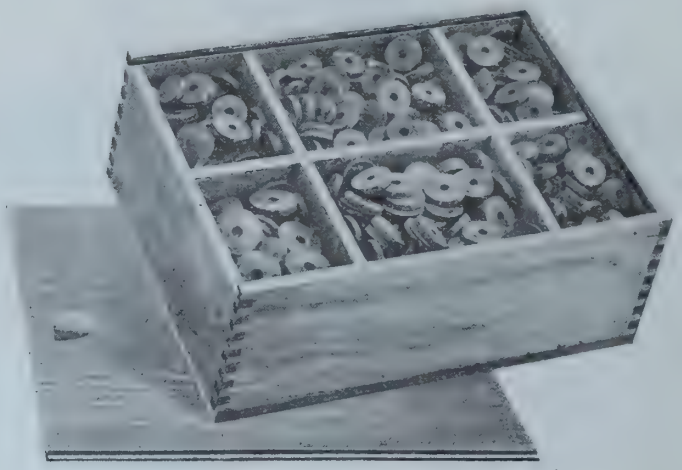
HEAD OFFICE - MONTREAL

Branches at Halifax, St. John, Quebec, Ottawa, Toronto, Hamilton, Kitchener, London, North Bay, Fort William, Winnipeg, Brandon, Regina, Saskatoon, Calgary, Lethbridge, Edmonton, Vancouver and Victoria.

Wolverine Genuine Flexible
Bibb Washers Assorted

PACKED IN STRONG WOODEN SHELF BOX

You not only save money in buying assortment of High-grade Genuine Flexible Bibb Washers, but receive also Strong, Dove-tailed Shelf Box without charge.



This is Number 4390

Tapered, Asbestos Fibre and Leather Bibb Washers, also complete line of Plumbers' Rubber Specialties listed in Catalog "C." Send for discounts.

Canadian Wolverine Company, Ltd., Chatham, Ontario

Pipe Fittings

Made in Canada



The Brand that has the Quality

M Brand Pipe Fittings, etc., give a service and satisfaction that will invariably get you re-orders and much new business as well.

A trial of the goods will prove this claim.

CAST IRON FITTINGS

With this brand mean fittings made with iron of high tensile strength—proper proportions and correct tappings.

RECESSED DRAINAGE FITTINGS

MALLEABLE FITTINGS

With this brand mean fittings made of Air Furnace Refined Iron, reamed and tapped to gauge with perfect threads.

Standard and Extra Heavy Flanged Fittings and Flanges. Galvanizing Malleable and Gray Iron Castings of all Kinds.

International Malleable Iron Co., Limited, Guelph, Ontario, Canada









FIVE WORKS—OVER 3,000 EMPLOYEES

It is our intention after the War to devote our energies to the intensive production of the following Specialities:

Gunmetal and Brass Valves and Cocks.
Steam, Water and Compressed Air Fittings generally.
Cast Iron Stop and Sluice Valves.
Semi-Rotary Pumps.
Extruded Brass and Bronze Bars.
Brass Bolts and Nuts, Studs and General Turned Work from the Bar.
Cast and Malleable Iron Cocks and Pipe Fittings.
Pressure and Vacuum Gauges.
Injectors and General Jet Appliances.
Engine Governors (Pickering, Proell and other types).
Spraying Machines for Insecticides and Limewashing.
Coppersmiths' Work.
"Stella" Brand Alloys, Manganese Copper, Silicon Copper, Ferro Zinc, Phosphor Copper and Tin, etc.

Business After the War

If you are interested in any or all of the lines mentioned and are in a position to take a hand in the energetic distribution of the same, please communicate with us NOW to our Head Office at the address below.

UNITED BRASSFOUNDERS and ENGINEERS, Limited

EMPRESS FOUNDRY

Cornbrook, Manchester, England

Over 50,000 Daisy Hot Water Boilers Now In Use—Are *You* Selling Your Share?



Daisy Hot Water Boilers are easiest to sell because they have an established reputation for exactly meeting the requirements of the modern home.

Every Daisy you instal will help build bigger business by bringing repeat orders for installation in neighboring homes later.

IMPORTANT NOTICE

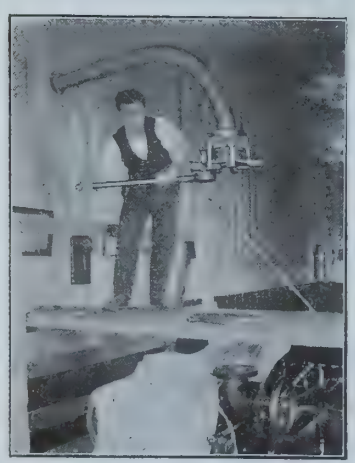
We desire to inform our readers that on and after Oct. 1st our address will be 136 Simcoe Street, Toronto.

WARDEN KING Limited, Montreal

BRANCH OFFICE: 200 ADELAIDE ST. W., TORONTO

PIPE THREADING TOOLS

It is Evidence Like This



"Toledo" Geared Adjustable Threading Tool No. 2 making a cut and thread on a 4-inch bend in position. It was desired to install a steam separator above throttle of engine, and the whole job was satisfactorily completed without removing the pipe line.

which proves the extra value of "Jardine" and "Toledo" Pipe Threading Tools

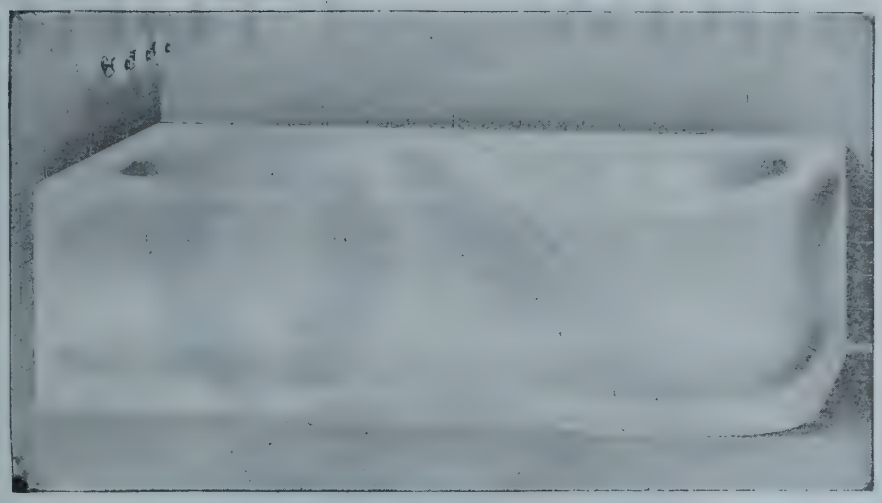
"Jardine" and "Toledo" Pipe-Threading Tools cut clean, sharp threads with a minimum of muscular effort. They permit of one man doing work which ordinarily requires two. But even more important than this, they will work in any odd corner. Instance the job illustrated in the accompanying engraving. Here is a case where, with an ordinary tool, the whole pipe line would have had to be taken down. The tool paid for itself on that one job.
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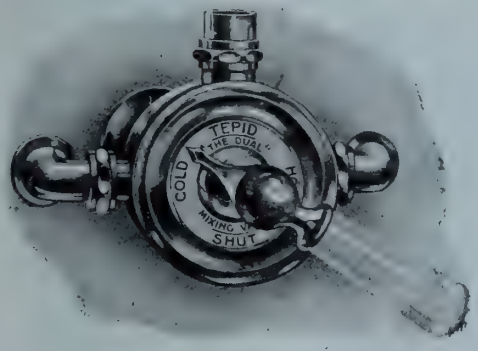
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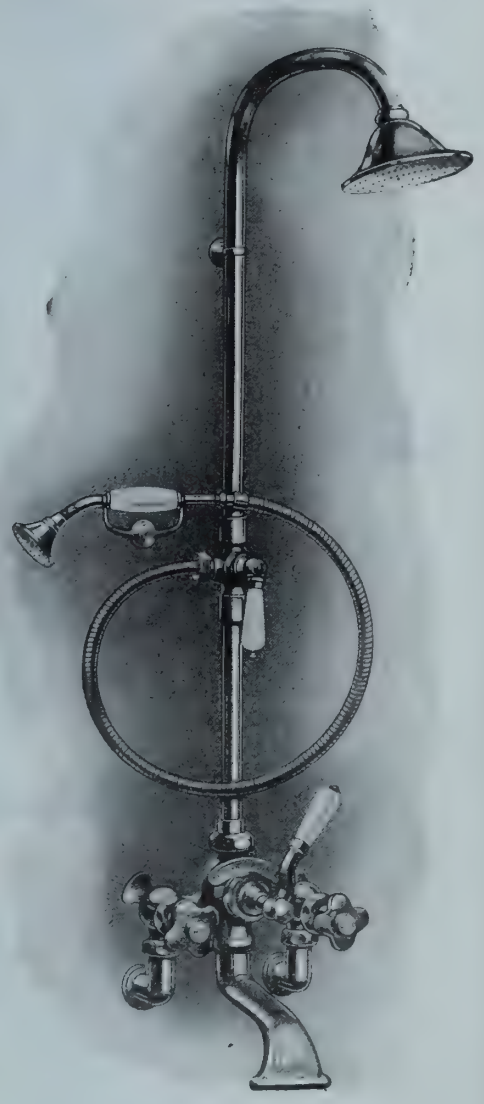
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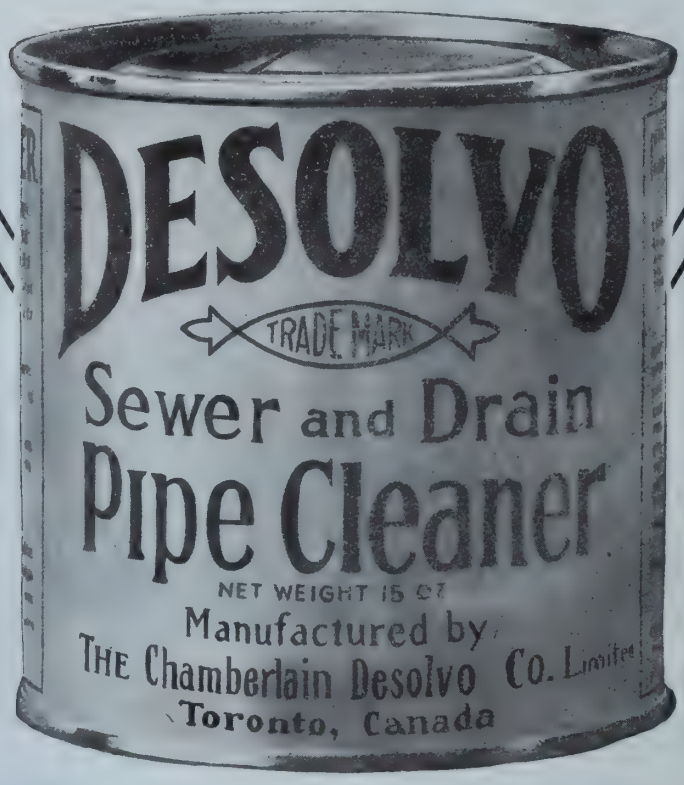
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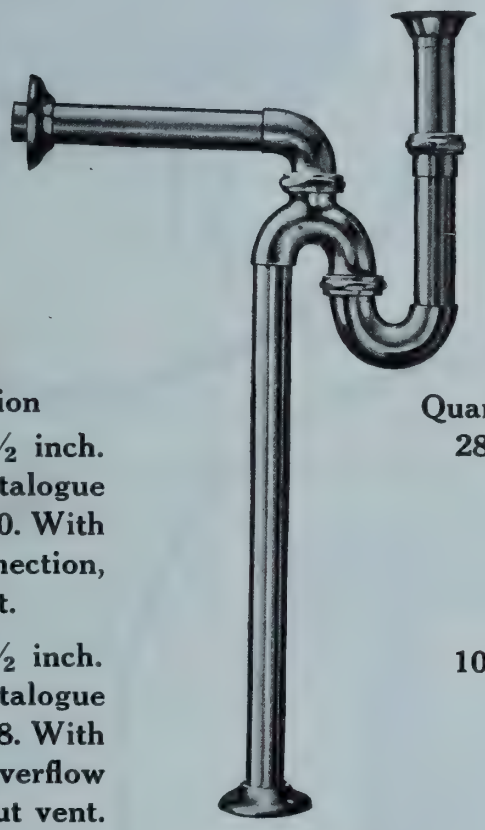
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101	S Traps, 1½ inch. Official catalogue number 4460. With sink connection, without vent.
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286	S Traps, 1½ inch. Official catalogue number 4462. Patent overflow plug and complete with vent.
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All these traps are made with heavy cast brass parts, ground joints and of No. 20 B&S gauge tubing. Fitted with floor and wall flanges and high-grade rubber stoppers, the stem of which is embedded in the rubber to prevent working loose.

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you install will sell others for you. Let us send you a sample tub. You'll be convinced, as many a dealer before you has been.

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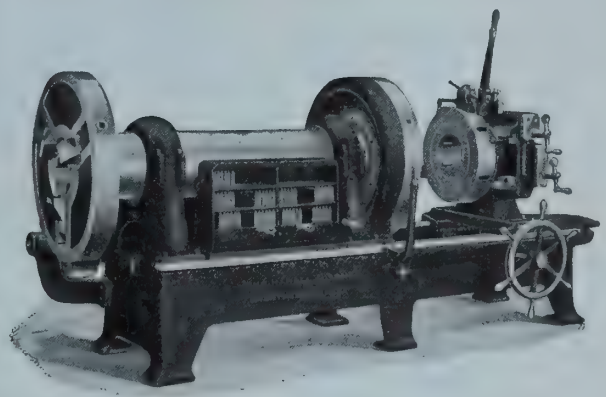


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These machines are equipped with a friction clutch, enabling operator to revolve pipe a few inches, if necessary.

Pipe Machines ranging from ⅛ to 18".
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The Story of War Under The Earth

THE German sappers had discovered and broken into a Canadian tunnel. They had planted a machine gun at their end and sent a shower of bullets down the dark, narrow passage whenever the Canadians made any effort to enter their underground galleries. The story of how two Canadians nailed steel snipers' shields to the front of a push cart and shoved it ahead of them up to the very teeth of the gun, and how they dropped a can of deadly explosive, hopped on to the cart, and let it coast back down the tunnel, while bullets rattled on the shield like hail and, finally, how the explosive blew up the machine gun and its crew and blocked the passage again—this remarkable story is told by Lieut. C. W. Tilbrook (who was one of the two) in the course of an article, "An Underground Tank," in October MACLEAN'S.

Recently a Toronto newspaper declared editorially that the public was tiring of war books and war stories because of the sameness of them. The newspaper was right. But the public literally devours any story of the war that is new. The series of articles that Lieut. Tilbrook has done for MACLEAN'S has been read with an astonishing amount of interest *because they are different from anything that the public has yet read.* Warfare in the tunnels is a terrible business—grim, silent, cruel. It is a strangely technical phase of warfare and the "sappers" go about their business with queer instruments that might have figured in a Jules Verne phantasy. To read of underground fighting, as Lieut. Tilbrook tells of it, is to get a vision of a new kind of war altogether —something gripping, fearsome and mystifying.

"An Underground Tank," is the best of his series. But, after all, it is only one feature in a long array that makes the October issue of MACLEAN'S one of unparalleled interest.

A STRANGE CHANGE IN WOMAN'S WORLD. By Agnes C. Laut.
The new status of women, arising out of the war, is treated in the powerful style of this famous writer, who came from the Canadian West. It introduces a new thought.

CONSCRIPTION AFTER THE WAR. By Brigadier-General A. C. Critchley.
A young Canadian who rose from Lieutenant to General in three years and originated the "Critchley Method" of military training, tells what he thinks about the need for compulsory service after the war.

THE LIFE OF MARY PICKFORD, by Arthur Stringer.
The second of a series of articles on Canada's most famous woman. No expense has been spared to produce the beautiful illustrations specially posed for the photographs.

THE FOUR FACTIONS AT OTTAWA. By J. K. Munro.
That the House will split into four, more or less, distinct groups is the guess of the author, a trained political observer. He outlines the reasons, humorously, pungently and impartially. It is a political article on new lines and will be found refreshing.

BONEHEAD BILL—Another Service Poem.
Robert W. Service, most popular of poets, sends all his war verse to MACLEAN'S. In "Bonehead Bill" he depicts the grief of a soldier for his fallen foe.

THE EVENTS OF A MAD WORLD
are summed up in the "Review of Reviews" which gives reprints of the best articles from the magazines of the world. All the best and most important articles are selected—five dollars' worth for twenty cents!

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CLARK TEMPERATURE BOOSTERS

will do all and more than we claim for them. They will not only increase the temperature and save coal when installed on a good heating system, but will make a **sick job well** and keep it well.

Write your jobber about it.

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Looking Forward—

We are preparing for the time that will come after the War, when business will have resumed its normal conditions, by perfecting our patterns and establishing a high manufacturing efficiency in our plant.

In the meantime we are keeping our production of Enamelware as low as possible and are using our every energy in manufacturing material which is essential for the prosecution of the War.

We are, however, in a position to supply immediate requirements of the Jobbing Trade and will be glad to have inquiries on Plumbers' Enamelware and Cast Iron Traps.

Our new booklet on Cast Iron Traps has been distributed. If you did not get one, write us. It's well worth having.

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SANITARY ENGINEER

VOL. XII. OCTOBER 1, 1918. No. 19

The Story of a Pound of Coal

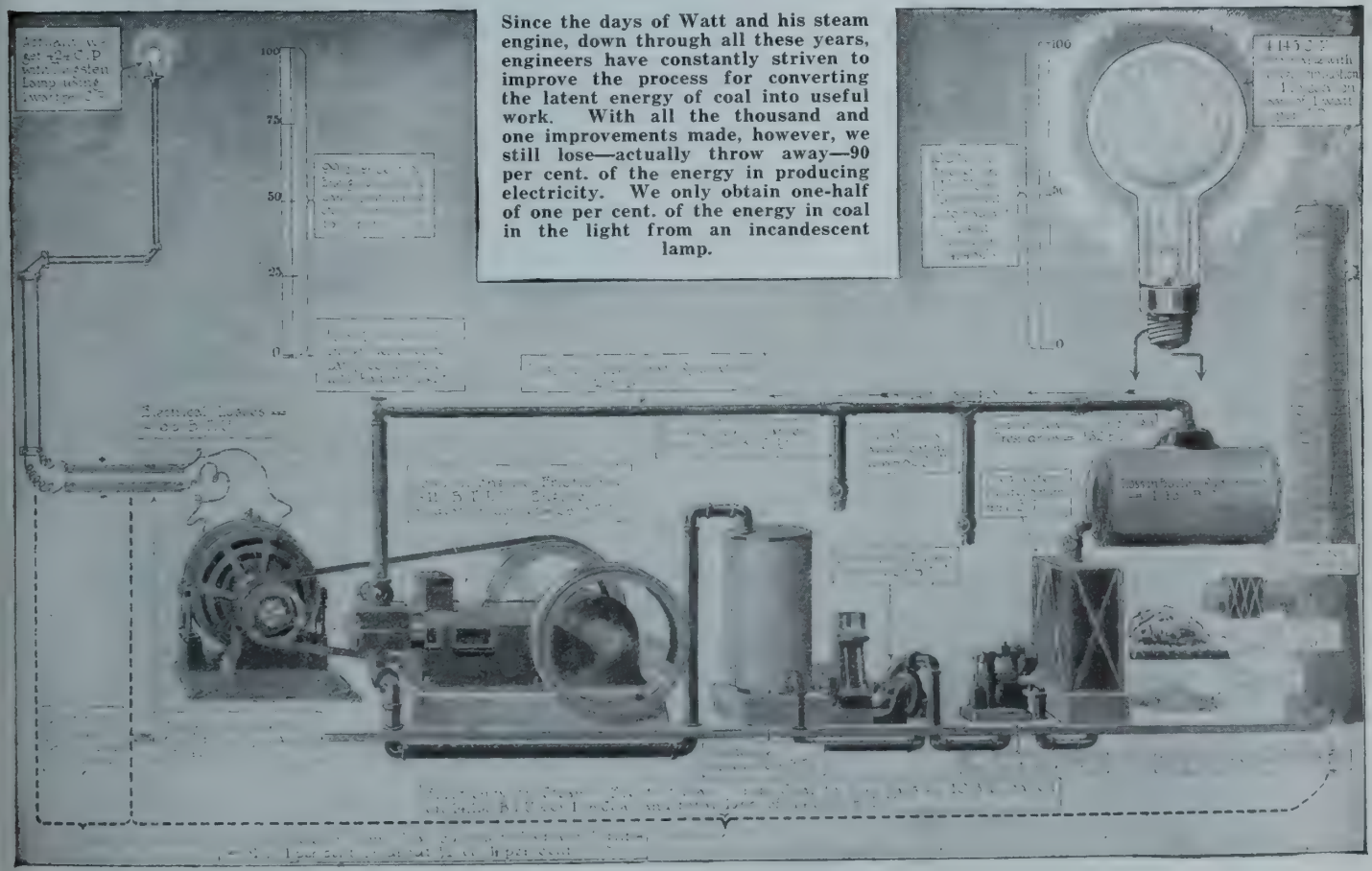
Explaining the Enormous Losses Occurring When a Pound of Coal is Burned Under a Boiler, the Steam Generated Used to Run a Steam Engine, and This in Turn Caused to Drive a Dynamo Supplying Electricity For Lighting

By H. W. SECOR, Associated Editor of "Electrical Experimenter."

DID you ever stop to consider how much of the energy present in a pound of coal is actually converted into electrical energy, even in the best power plants of to-day? In a few words it is this—that out of every pound of coal burned in a steam boiler in an electric power station we only succeed in converting about **one-half of one per cent.** of the total energy in that pound of coal into radiant light! The average person believes that in this so-called "electrical age" we have reached well-nigh perfection, but the above figure illustrates vividly that the electrical and steam engineers have many problems yet in front of them before anything like real efficiency is attained in converting the energy in coal to **electric light**, or for that matter into **electrical energy** with which to feed the lamps and other apparatus. For the largest and most highly developed steam-electric plants of to-day do not realize an over-all efficiency of much above **ten per cent.**

This figure of ten per cent. represents the ratio between the coal burned in the boilers and the current delivered by the dynamos to the bus-bars, and shows that what most persons believe to be a wonderful and highly efficient electric power generating station is really throwing away about 90 per cent. of the energy in the coal it buys. A modern water-power electric generating station may show a gross efficiency of as high as 56 per cent.; therefore there is something radically wrong with our coal-burning methods, beyond the shadow of a doubt. Several well-known inventors have ventured to design a different type of apparatus for developing electrical energy direct from coal, but so far no commercially successful method has been perfected. Even Edison has tried his hand at perfecting such a machine, but so far we have not advanced beyond the well-known boiler and fire-box stage in our commercial utilization of the energy in coal.

Therefore it is of interest to study this important subject a little and to find out where this enormous loss takes place.



Since the days of Watt and his steam engine, down through all these years, engineers have constantly striven to improve the process for converting the latent energy of coal into useful work. With all the thousand and one improvements made, however, we still lose—actually throw away—90 per cent. of the energy in producing electricity. We only obtain one-half of one per cent. of the energy in coal in the light from an incandescent lamp.

The accompanying illustrations show in a graphic manner just where these losses occur in each part of the system of a modern steam-electric plant. The various losses and efficiencies are taken from a report made in the transactions of the **American Institute of Electrical Engineers** by a well-known electrical engineer, Mr. H. G. Stott, and represent the efficiency of a large steam-electric plant. Some of the large present-day plants of this type obtain a slightly higher over-all efficiency than the one here cited, for instance, the Interboro Rapid Transit Company's plant in New York City showing a gross efficiency between coal burned and electricity developed, of about 12 per cent.

Let us now resume the discussion of the present steam-electric plant here illustrated. In looking at the illustration from right to left, keep in mind the energy in a pound of coal at the start, viz., 14,150 B. T. U. (British thermal units.) One B. T. U. is the amount of heat required to raise the temperature of 1 pound of pure water 1 degree Fahrenheit, at or near its maximum density, 39.1 degrees Fahrenheit. One B. T. U. is also equivalent to 778 foot pounds of energy; or 1 B. T. U. per hour = .000293 kilowatt-hour, also 1000 B. T. U. per hour = .293 K.W. hour). Having this quantity in mind the per cent. loss in each apparatus is readily judged as we progress from right to left or reference to the following table prepared by Mr. Scott gives these percentages directly.

Thus we see where the energy in the pound of coal goes to before it finally reaches the switch-board bus-bars. In other words, starting with 100 per cent of energy in the coal when placed in the fire-box, we eventually throw away nearly 90 per cent. of this energy, or to be exact 89.7 per cent., and deliver to the electrical system only 10.3 per cent. of the power we started with, when we lighted the fire in the boiler.

If we operate electric motors from this electrical energy we fare quite well, as the motor has an efficiency of from 80 to 90 per cent. or more, depending upon the size. That is, the motor converts say 90 per cent. of the electrical energy put into it into mechanical power at the pulley. But in converting the electrical energy into radiant light we find that the most efficient of all incandescent filament lamps—the tungsten lamp—only realizes about 5 per cent. efficiency ,and requires about **1 watt per candle-power.** Thus of the electrical energy put into the lamps we only receive five per cent. in the form of radiant light,—the other 95 per cent. is lost. Lost, all because we of to-day do not know enough to more efficiently convert electric current into radiant light. At the present energy consumption of 1 watt per C. P. for a tungsten lamp and figuring on the perfect transformation of the energy in **one pound of coal**, viz., 14,150 B. T. U. we would get (14.15 x .293 kilowatt-hour = 4.14 K.W. hr.) 4,145 candle-power, as represented by the large lamp at the right of the illustration. As a matter of fact we only manage to get 1.45 x .293 K.W. hr. or .424 kilowatt-hour, owing to the nearly 90 per cent. loss in the steam-electric generating system. This results in 424 candle-power, as represented by the small tungsten lamp at the left of the illustration, based on 1 watt per candle-power.

The **over-all efficiency** of the entire system, from coal burned to radiant light is thus seen to be 10.3 per cent. multiplied by 5 per cent. or .51 of 1 per cent.; or a little over one-half of 1 per cent.! Think of it! All we get out of the coal, no matter how much we burn, is a paltry **one-half of one per cent.** One immediate remedy for this wasteful system of utilizing coal as a source of energy is the mouth-of-mine plant. These electric generating stations, placed at the mines, eliminate all carting and hauling of coal and permit the high tension electric current produced to be transmitted hundreds of miles at very high efficiency.

ANALYSIS OF AVERAGE LOSSES IN CONVERSION OF ONE POUND OF COAL INTO ELECTRICITY

No.	Part of Plant.	B.T.U.	Per cent.	B.T.U.	Per cent.	
1.	B. T. U. per lb. coal supplied	14,150	100.00			
2.	Loss in ashes			340	2.4	
3.	Loss to stack			3,212	22.7	
4.	Loss in boiler radiation and leakage.			1,131	8.0	
5.	Returned by feed-water heater	441	3.1			
6.	Returned by economizer	960	6.8			
7.	Loss in pipe radiation			28	0.2	
8.	DeDlivered to circulator			223	1.6	
9.	Delivered to feed-pump			203	1.4	
10.	Loss in leakage and high pressure drips			152	1.1	
11.	Delivered to small auxiliaries			51	0.4	
12.	Heating			31	0.2	
13.	Loss in engine friction			111	0.8	
14.	Electrical losses			36	0.3	
15.	Engine radiation losses			28	0.2	
16.	Rejected to condenser			8,524	60.1	
17.	To house auxiliaries			29	0.2	
		15,551	109.9	14,099	99.6	total loss
		14,099	99.6			
	Delivered to bus-bar	1,452	10.3	gross-efficiency		

CO-OPERATION NIGHT

WEDNESDAY, OCTOBER 16, 1918

The Toronto Committee of the Ontario Society of Domestic, Sanitary and Heating Engineers

extend to all sanitary and heating engineers and those having the interest of the trade at heart a most cordial

INVITATION

to attend a meeting to be held on above date

AT THE CANADIAN FORESTER HALL
22 COLLEGE STREET, TORONTO

8.15 P.M. SHARP

Chairman Kenneth B. Allison, of the Educational Committee, will introduce the speaker of the evening,

John C. Kirkwood, Esq.

ADVERTISING COUNSEL

SUBJECT:

CO-OPERATIVE ADVERTISING

as it should be applied to the sanitary and heating engineering trade.

The Entertainment Committee have arranged for a moving picture programme, and refreshments also will be served.

Every member of the craft is asked to make this a real bumper evening by inviting all interested in the trade to be on hand.

It is a great honor to the trade to be able to secure the services of such an authority on advertising as Mr. John C. Kirkwood, and the above committee earnestly desire that each and every one should turn out to hear this address. The benefits will be of inestimable value to all.

DON'T FORGET THE DATE, OCT. 16TH, 1918.

Reasons for Failure of Heating Systems*

Poor Building Construction Chiefly Responsible For a Large Per Cent. of Heat Loss— Heating Engineers Take Too Great a Risk in Trying to Heat Buildings Not Fit to Live in More Than Nine Months of the Year

By J. D. Hoffman, Lafayette, Ind., member of American Society of Heating and Ventilating Engineers.

THE time has come for a campaign of education for more satisfactory heating and ventilation in the homes of our country. Business blocks, auditoriums, schools and buildings of larger proportions have been carefully worked out, and because of their importance as public utilities, have been treated with such respect by both architect and engineer as to insure fairly satisfactory service. The home of the private citizen of moderate means, on the contrary, still suffers grievously. The need for corrective agitation is apparent, and our Society should find some means through which to educate the public to demand and see that they get more satisfactory heat in their homes.

The recent coal situation has served the purpose of calling to the attention of heating and ventilating engineers that in the future economic problems of the home they must necessarily become more factors. Heretofore they have pacifically endeavored to fit their heating and ventilating systems into ill-conceived and poorly constructed houses and have trusted to their ability as engineers to overcome the handicap imposed upon the systems by architects or constructors who knew little and cared less about the requirements of home comfort. The heating and ventilating engineers this past winter have shown their willingness to do anything in their power to tide over the acute stages of panic and suffering due to the fuel shortage. They have unceasingly counseled "fewer fires" and "more economic firing," because under the conditions this was all that could be done. Then, nothing counted as much as direct coal saving but now that the stress of severe winter has passed, we may ask ourselves: What and how may the heating and ventilating engineers do to assist in laying the foundation of a more effective economy in the years just ahead?

I have especially in mind some of those conditions (principally residential) that not only work against economic heating, but absolutely prevent it in a large number of cases. Some of these conditions are due to the mistakes of the architect, with knowledge aforethought or otherwise, some of them to those of the heating man (or hardware man) who installs the system, and some to those of the householder who practising false economy is not willing to pay the price of good work.

First let me call your attention to the popular ideas and ideals of ventilation. Years of experience and observation of the medical fraternity all over the world have combined to develop such wholesome respect for normal outdoor air as health preserver, that we were coming to understand that this was one of the best health preservers and about the only cure, when cure were possible, for lung and throat diseases. Unfortunately, well meant scientific experimental data have been so misinterpreted by certain people as to make the question of the purity of the air a non-essential. I quite agree with Dr. W. A. Evans, of Chicago, that although we are not able to determine the exact reasons why pure air is a food and why, on the other hand, respired air is harmful, this fact is no proof that the healthfulness of pure air which has so long been considered axiomatic with us, should be so discounted. Many published articles, emphasizing such revolutionary ideas, have gained a considerable following throughout the country among those persons whose attention has not been directed particularly to the subject, and especially among landlords who would profit by the abolition of the fresh air idea. The latter element may be classed as the real obstructionist, and if we add to this group the list of those conscientious householders who, through lack of information or through misinformation do not appreciate the value of pure air, it is very easy to see why the death rate in our shut-up homes is an increasing variable during the winter months, reaching a maximum along in February or March. When the health of the people is at stake, it is far better to err with too much than too little outdoor air.

In the face of what has just been said, however, we need to urge a campaign for better built houses — houses that are made to *live in* and not merely to rent or to *sell*. It is a sad commentary on our American domiciles, but it is a fact that the average residence is a satisfactory habitation for only nine months in the year. It has been stated, that in 1912, 75 per cent. of the residences built in the United States cost each $5,000 or less. This ratio, if correct, has probably not changed much in the interim. From what I know of the methods of construction of the average residences of this class, I am safe in venturing that 75 per cent. of this number are not satisfactorily heated. Further, I am willing to venture that 75% of the number not giving satisfaction are failing, not so much from the lack of gray matter on the part of the heating man, as from unsatisfactory house design and construction.

In most of the ordinary balloon-framed houses the sheathing is very inferior in grade and loosely butted at the edges, when there should be solid boards and lap joints. Some of the houses have no building paper or its equivalent, some have one course of the building paper and a few have two, but very few courses are laid with care to serve as an insulation. Two courses of paper in face contact are, it should be stated, inferior to one course with the sheathing and one course woven in and out over the studding; or, to one course with the sheathing and one course on the inside of the studding, with strippings under the laths to bring the plaster free from the paper surface. Again, suppose the wall is well protected against inleakage but the upper and lower ends of the spaces between the studs are open; in this case there is free convection of air upwards between the inner and outer layers of the wall and the heat that should be kept within the room is dissipated to this air current and lost to the attic, and the conditions are worse than the open wall in that the heat is lost and there is no corresponding physical benefit from inleakage.

One of the worst types of construction, and one I have frequently met with, is the bungalow type second floor outer wall which offsets within the plane of the first floor outer wall. Irrespective of the type and quality of main wall construction (balloon-frame, brick or stone), the second floor wall is studded down from a ceiling level near the roof line, lathed and plastered on the inside of the studs and on the ceiling; and the

EDITOR'S NOTE.

It is just such articles that should convince every heating engineer on this continent that there should be some practical form of heating by-law in operation in every province. In fact, such an ordinance should come under the mechanical or engineering section of a Federal Health Department. The problem is not only one which involves a saving of fuel, but also proper heating and ventilating of buildings, the latter being purely and simply a health matter.

The article also contains some splendid selling talks which if thoroughly taken to heart can be used to good advantage when advice is being given by the average heating engineer to his customer.

*Abstract of paper presented before the Illinois chapter of the Am. Soc. Heating and Ventilating Engineers at their semi-annual meeting held in Buffalo, N.Y., June, 1918.

outside of the studs and joists left open to the cold spaces under the roof. In two otherwise well designed and properly heated stone bungalows called to my attention recently, where the heating systems were pronounced failures, the heat lost through the second floor walls and ceilings to the cold spaces underneath the roof was so great that a cold draft of air down the open stair was sufficient to make the first floor uncomfortably cold. A careful inspection of the heating systems showed them sufficient in capacity to supply similar buildings with ordinarily well constructed walls, and excessive in capacity for the heavy stone outside walls these houses had.

Everything seemed to be satisfactory but as a last resort I asked to see the attic construction. Here we found that the exterior walls and ceiling of the second floor had only one ordinary lath and plaster thickness separating the rooms from the attic spaces. The outside temperatures at the time were near zero and the temperature in the attic spaces showed that the heat was going through these plaster partitions like water through a sieve. My advice in each case was to surface the outside of the studs and joists with heavy building paper or tight boards, or better, with both. I have mentioned these two cases because they show how a splendid construction may be set at naught by inexcusable carelessness in some hidden detail of construction. These houses that on the face of things were overheated, were as a matter of fact only partially heated and through no fault of the heating man excepting that he should have insisted upon knowing what kind of construction would be used in the various walls. Most cases of poor house construction that come to the attention of the heating and ventilating engineer differ, however, from the ones mentioned in that the failures are due to general house debility and it is more difficult to say which bad feature has the greatest effect to produce failure of the heating system.

A Word of Warning to the Heating Engineer

It freqently happens that in order to conceal the piping the heating engineer often crosses the wall and carries his pipes through the attic spaces. The practice improves the appearance of the room somewhat (and some householders insist upon it), but it is opposed to economy. In one striking example of how not to do it, a new vapor system was installed in a stone bungalow last summer with all the second floor returns and some of the mains traversing these attic spaces. The result was a freeze-up in every radiator on the windward side, alternating of course as the wind shifted so as to give every room some of the same experiences, and during one week of the extreme weather last winter every second floor radiator was out of commission. No insulation was put on the pipes and I doubt if they could have been successfully insulated against the zero temperatures which were indicated by the thermometer near the pipes. Vapor system returns are especially susceptible to freezing conditions.

Another feature of house design that is frequently fatal to the plans of the heating engineer is the overhanging room with only one thickness of ⅞ inch flooring on the room and light ceiling over the porch. This always gives a cold floor that is not only uncomfortable to the occupants, but eliminates heating possibilities on cold days. These remarks do not apply of course to sleeping porches with no heat. If an overhanging room is desired, be sure to provide for a well insulated floor.

One feature of house construction that reflects against the builder rather than the architect is the loose construction around the windows. The owner wishes free moving sash and the workmen give him everything he could desire in this regard. But how about the person who is expected to inhabit the room on a zero day when the wind is blowing a 20 mile velocity? I have caught snow in my hand at a distance of 2 ft. from a tightly locked window, in a house supposed to have better than ordinary construction. What can the Society do to better such conditions? Window strips, metal weather strips, and storm windows may be urged. Storm windows, top hung, give satisfactory insulation during the cold days and at the same time provide ventilating possibilities o moderate days. An average nine room house can be supplied with good storm windows, west, north and east for an expenditure of from $75 to $100 and the coal saving will pay for the first cost in two years' time. Such storm winndows are no hindrance to open window ventilation when desired.

Next, let us look at the chimney. Several points in common practice among architects tend toward inefficiency. The outside chimney, in spite of its possibilities toward exterior ornamentation, is not a good draft producer because of the chilling effect of the outside air. Where a chimney is required in an outside wall it should be not less than two bricks thick (8 in.) on each side of the flue at the thinnest part, increasing to at least 12 in. on the lowest part. This is improved if the chimney wall is double with an air space between the walls. Such an air space may be closed in with an occasional layer of header bricks from the outside wall nearly touching the inner wall. These header bricks cut off air circulation and in addition steady the inner wall. They must not bind the walls together since the lineal expansion of the two shafts are not equal. The chimney is improved occasionally by an ornamental wall of cobble stones laid upon the outside of the chimney proper. All chimneys should have an inner lining of hard burned tiles well cemented at the joints and embedded with the inner brick surfaces.

The ideal shape of the chimney is round, but this shape does not lend itself to convenient construction. Since most chimneys are too thin on the free area, an approach to a square would be desirable. Assume the chimney to be otherwise properly designed for height, size and shape for furnace or fire place service, as the case may be, the principal point to be observed in its construction is to protect the gases from the chilling effects of the outside air. An interior chimney overcomes this difficulty completely and in my opinion is much the better proposition.

With a strong draft assured at all times in the smoke pipe between the furnace and the chimney, it is a simple process to control the rate of fuel consumption in the heater by keeping the ash damper closed, the damper in the fire door open, and regulating by the smoke pipe and check dampers. This method of regulation probably gives a more uniform rate of burning than by regulating the ash damper, but it presupposes a furnace of sufficient capacity to permit eight hour intervals between firings.

Satisfactory chimney draft is a point to be given serious consideration. Householders worry about smoking fire places and speak of the faulty construction of the chimneys, all of which is true in many cases, but they fail to grasp the fact that the same chimney enclosed in the house construction would undoubtedly have sufficient draft so that smoke would never enter the room. Again, an inside chimney is not only more constant in its draft, but its location frequently provides an opportunity of collecting together some of the warm air stacks, if the house is heated by furnace heat, and assures a good warm air circulation to the rooms at all times.

Let me add a word of caution in regard to the inside chimney: Under no consideration should the house construction be rigidly fixed to the chimney. This is too frequently done. The expansion and contraction of the chimney causes movement of the floors, thus cracking the walls and ruining the fits of the doors, casings, etc.

(Continued in next issue)

AFTER SOUTH AMERICAN TRADE

That the United States is busy planning for after-the-war trade is shown by the fact that the President of Brazil has authorized the American Steel Co.'s Brazilian corporation to operate in that country. This is a branch of the American Steel Export Co. of New York City. The objects of the company are the manufacture of iron, steel, manganese, copper, and other metals and their alloys, the purchase and sale of metal products, and the purchase and exploitation of mines and timber lands of all kinds. The capital stock of the company's branch is $20,000, divided into 200 shares of $100 each.

City of Brantford Plumbing By-law

Plumbing By-law Number 1450—Some New and Very Practical Clauses Not Embodied in Many Plumbing Ordinances—Each Clause of Importance Commented Upon—Charges Made for Each Inspection

(Continued from Aug. 15 issue)

WE concluded the article which appeared in August 15 issue by commenting upon clause 17, which dealt with the length of pipe terminal which should project through the roof, etc.

Fall Required

18. No soil pipe or waste pipe when practicable, shall have at any point a fall less than one-quarter of an inch to the foot.

Separate Pipe Required

19. Each house or building shall have its own separate soil pipe or drain.

Direct Arrangement Required

20. The arrangement of soil and waste pipes shall be as direct as possible.

It will be noted that clause 18 is of a general nature and one that is embodied in almost every plumbing by-law.

Clause 18, however, cannot go without some little comment. In the main it is all right, but there are one or two points that are debatable. For example ,it is not quite clear. It simply reads: "Each house shall have its own soil pipe or drain," not "And drain." Neither does it state where this drain shall terminate, whether at a point outside the building or at the main sewer. By stating where it shall terminate, and whether each house shall have its own separate soil pipe or drain all the way to the sewer, or say at a point 3 feet from the outside wall, this clause would certainly have been more explicit.

The same with clause 20, which is not really complete, but which would have been had the following words been added: "And any deviation from a straight line shall be made by using regular soil pipe fittings." This clause would have been more complete, too, if accompanied by a drawing as shown, and which also makes such a clause very definite.

Continuation of Vent Pipes

21. The vent pipes from different fixtures are to be carried up through the roof the same as soil pipes, or may be branched together and pass upward and above the roof, or may be connected with the main soil pipe at least three feet above the inlet of the highest fixture. The diameter is to be not less than three inches where it passes through the roof.

This clause, too, could have been made to read a little clearer if the distance, or rather the length, of any horizontal vent pipe had been mentioned, for example: It would be rather bad practice to allow the vent, say from a wash basin, to be connnected to the soil pipe stack. If it required a horizontal pipe 15 or 20 feet long to make the connection, such a condition would warrant the vent being carried up through the roof separately. But clause 21 leaves it optional, when the word "May" be branched, or "May" be connected, etc., is used There is really nothing definite when the word "May" is used in a clause as it is used in clause 21. We merely point this out so as to show the difference between "May" and "Shall."

Then there is another point which we believe could be improved in this clause and that is to demand that all pipe terminals be increased to 4 inches. It would eliminate the stocking and carrying at least one size, viz., 3 inch. If we sanitary engineers are ever to hope to procure a uniform plumbing code easily adaptable to every condition, we should strive to use as near as possible uniform fittings. Almost every municipality now requires that all vent pipes or soil pipe stacks be increased to not less than 4 inches.

Refrigerator Drain

22. The drain pipe from refrigerator or other receptacle where provisions are stored shall not be connected with the waste pipe, soil pipe or sewer. It shall discharge over some sink or other fixture supplied with city water, except water closet. Refrigerator waste pipes at floor line under refrigerator to be fitted with a cast iron combined refrigerator drain and trap.

Open Discharge From Motors, etc.

23. Waste from vacuum cleaners, water lifts or water motors must discharge over open fixture or be connected into house side of fixture trap, except motors with large discharge of water, such as organ motors and elevators, which may be connected with the sewer direct when properly trapped with a deep seal trap as provided in Section 44 relating to floor wastes.

Safe Discharge

24. Where there is a safe under a water closet, bath, urinal, wash basin, sink or other fixture, it must be drained by a special pipe not directly connected with any waste pipe, soil pipe or sewer, but discharge into some place in open sight.

Fixtures Trapped

25. Every water closet, urinal, basin, sink, bathtub and every washtub or set of tubs must be trapped as near the fixture as possible and never more than two feet therefrom, excepting any fixture where there is danger of the trap freezing. One trap may serve a battery of four basins.

The above four clauses are all about as practical as could be desired; all up-to-date.

Venting

26. All traps are to be re-vented either by continuing waste pipe up through roof or connecting into main vent pipe above highest fixture. All vent pipes are to be carried above fixtures which they serve before entering main vent. The system of venting known as continuous venting is to be used where at all practicable. Crown venting is to be discontinued where possible. The distance from centre of inlet or house side of trap to vent pipe shall not be more than two feet. All vents are to be run in such a manner that it will not be possible for any condensation to collect in them. In buildings where there are a number of fixtures above one another and re-vented into one main re-vent pipe, this pipe is to be connected into main soil or waste pipe below the lowest fixture, and the waste from the lowest fixture other than a water closet shall discharge into same. No vent pipe shall be less than one and one-quarter inches in internal diameter. For water closets and slop sinks with three inch trap not less than two inches in diameter will be allowed.

Vent Pipes May be Branched as Follows:

2—1¼ inch vent openings will be allowed on 1—1¼ inch pipe.

4—1¼ inch vent openings will be allowed on 1—1½ inch pipe.

2—1½ inch vent openings will be allowed on 1—1½ inch pipe.

12—1½ inch vent openings will be allowed on 1—2 inch pipe.

6—2 inch vent openings will be allowed on 1—2 inch pipe.

12—2 inch vent openings will be allowed on 1—2½ inch pipe.

24—2 inch vent openings will be allowed on 1—3 inch pipe.

All vent pipes exceeding thirty feet in length shall be increased one size every succeeding thirty feet, or fraction thereof.

This clause contains some very good rules. For example that portion where it requires that all vent pipes shall "be run in such a manner that it will not be possible for any condensation to collect in them." Another commendable portion of this clause is where it reads: "In buildings where there are a number of fixtures above one another and re-vented into one main re-vent pipe, this pipe is to be connected with main soil or waste pipe below the lowest fixture other than a W. C. shall discharge into same."

It will be seen that with such a system it would be almost an impossibility for condensation to collect if the main vent pipe is connected to foot of stack; not only so but by having the lowest fixture connect into the foot of the vent, provided the fixture be not a water closet, the waste from the fixture will serve to keep the lower end of the vent clear.

Traps

27. Every trap used on the drainage or plumbing system shall be self-cleansing. No form of trap which depends for its seal upon the action of movable parts shall be used. No trap which depends upon concealed interior partitions or deflectors for its seal shall be used, except in earthen-

ware fixtures where the seal of the trap is plainly visible.

Non-Syphonable Traps

28. Where a plumbing fixture is placed or located a distance of fifteen feet or more in a horizontal direction from the vertical main soil or waste pipe, it may be trapped with a non-syphon trap of approved pattern. Where the addition of a fixture is made in work already installed, or in new work where it is found impracticable to vent the trap of a fixture, a trap of non-syphon pattern may be used on the approval of the Inspector.

Clause 27 needs no commenting upon, but clause 28 is a little unusual. We do not quite agree, for instance, if there is such "an animile" as a non-syphon trap. Why not use them on short waste lines? Where there is a long horizontal waste pipe there is a far greater need for an open or rather a liberal sized vent pipe. If any of our readers will show us a condition where "it is found impractical to vent the trap of a fixture," we would be pleased to be enlightened on that matter.

Another point in this clause we do not like and that is where it reads: "Where the addition of a fixture is made in work already installed," etc. Here is where a "scamp or curbstone plumber," who wants to break the spirit of the law, can do so under this clause. He can rough in a stack, put in the closet, and at a later date he can install the rest of the fixtures at will and not vent a fixture. It may be argued that other clauses in the by-law would not permit him of so doing. But that is not the idea. Every clause should be clear and final in itself each under its own heading. It may also be argued that such a trap would have to meet the approval of the inspector, etc., but inspectors like the average individual are only human. Of course, we quite understand that there are conditions which require some hard thinking, and where the enforcing of many such clauses, if too rigid, would appear to be almost a hardship. But we are dealing with matters of health and no chances should be taken. And by-laws are not made for those whose sole aim is to live up to the true spirit of the law, but rather two other classes: those who do not know all the vital principles involved in sanitary plumbing construction, and those who sit up at night trying to find some way of evading plumbing by-laws. There are scores of the latter type, which makes SANITARY ENGINEER believe that it is best to meet such men on their own ground and make it impossible to do wrong and easier to do right.

Chimneys Not to be Used as Vents

29. No brick, sheet metal or earthenware pipe or chimney flue shall be used as a sewer ventilator, nor to ventilate any trap, drain, soil pipe or waste pipe.

Fixtures Prohibited

30. No closet or other convenience which allows the escape into the house of air or gas which has been confined in any part of it or from the drain or soil pipe, or which allows the accumulation of filth in or about it, shall be fitted up or used.

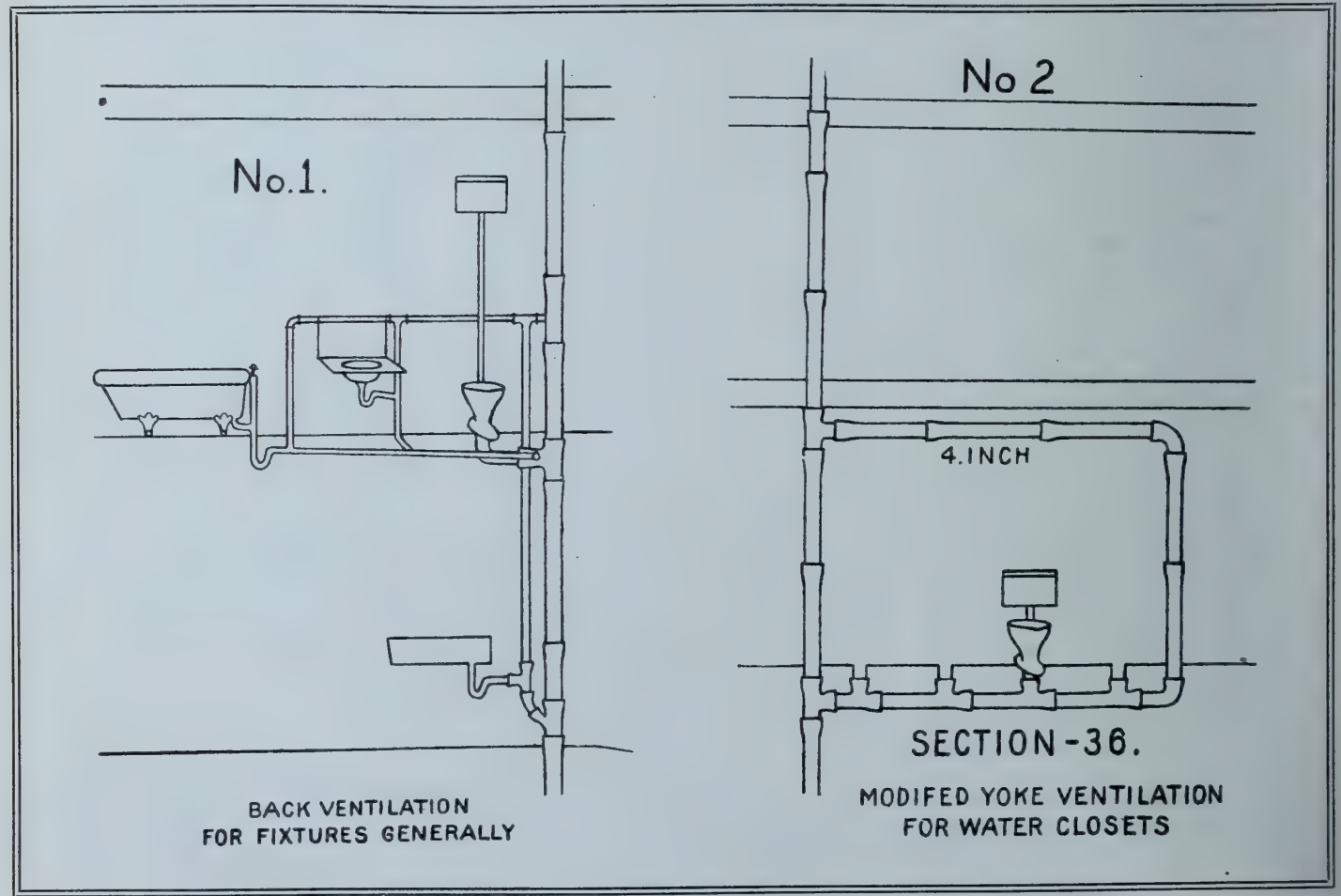
Compartment Ventilation

31. No water closet or urinal shall be placed in a non-ventilated room or compartment, and in every case the room or compartment must have communication to the outer air by a window of at least three square feet area cross section, or an air shaft or duct of at least twenty-eight square inches area cross section, which shall not be used for ventilating any habitable room or compartment.

Clauses 29 and 30 are general, but 31 is a little out of the common. Most clauses under "Compartment Ventilation" are rather more stringent. Very few will allow water closet or even urinal compartments to be placed in any location which is not next to an outer wall so as to have not only free ventilation, but also not less than 4 square feet of light area. We are apt to forget that light is just essential to sanitation as any other element. A compartment may be perfectly ventilated and yet be very insanitary, in fact the light of the sun will often be the means of killing far more injurious germs than would ventilation; the latter would, of course carry away any obnoxious odor. The light of the sun is one of the most effective purifiers we have, and it is our opinion that no W. C. or urinal compartment should be planned that is not naturally lighted by a direct outside opening.

As regards the size of the ventilating

Continued on page 38



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USING PROPER MATERIAL IS TRUE CONSERVATION

ON another page there appears an article entitled Wrought Iron Versus Cast Iron for Soil Waste and Drainage Pipes. SANITARY ENGINEER has devoted considerable space to this question and will devote more as it is found necessary.

In some of our contemporaries we note that manufacturers of clay tile pipe are trying to prove that to conserve iron for war purposes, every sanitary engineer should use tile pipe in place of cast iron pipe for home drains, etc. On the other hand we were told by manufacturers of wrought iron pipe that such material was far superior to cast iron, and some still adhere to that statement in spite of proofs to the contrary. Now, where do such impractical and misleading statements lead us? Let us ask still another question. Where is the true spirit of conservation to be found in such statements?

In the case of the clay tile pipe manufacturers they appear to think that a town, the earth of which is sewage saturated such as was old London at the time of the great plague is preferable to a healthy town. There are towns and cities on this continent where, because of tile drains, it would be almost impossible to procure clean, healthy earth, and where, if it were not for a merciful Providence, such towns would not be fit to live in, much less worth fighting for.

This great war is being waged because of there being too many mentally and morally diseased people living in Germany, and sanitary engineers exist either because there are unsanitary conditions existing or to prevent unsanitary conditions arising.

The person who installs clay tile pipe within the walls of a building is not, nor can he ever be a sanitary enginer so long as he continues so to do. So much for the need of keeping our earth and surroundings of our buildings below the ground level in a pure clean condition. Now let us consider pipe used for conveying soil and waste fluids, etc., from sanitary fixtures. We are proving almost every day in Canada that wrought iron or wrought steel pipe is unfit for use in place of cast iron for the purpose above named, and in spite of the stand taken by manufacturers of wrought material the facts remain that nature will do no more for them than for any one else.

Several months ago SANITARY ENGINEER took exception to its use in the Parliament Buildings at Ottawa, but influence contrary to practical proofs and evidence prevailed, and to-day we find that one of the very buildings in which wrought iron pipe was claimed to be giving the best of satisfaction is at this date having cast iron soil pipe and fittings installed while the wrought pipe is being torn out at a cost we believe of figures around the $50,000 mark.

Furthermore when the proper time comes we will repeat the same story regarding the Parliament Building installation.

STANDARDIZATION OF GOODS

IF we were to state that variety of fixture and fittings as well as unnecessary duplication had resulted in a great deal of waste, we doubt very much if there would be one dissenting voice in the whole sanitary and heating trade. And no doubt this particular trade is no exception to the rule. For one example, where is the condition that would not permit of using a T.Y. in place of a T? Simply because a T.Y. branch falls in a downward direction slightly is no reason why it should not be used on a loop or continuous vent, or, in case of trap vents, what is there to prevent the use of 1½ in. vents on 1½ in. straps? Or even the making of 1¼ in. lead waste pipe.

It may be argued that the cost of the smaller sized pipe is less. We doubt not that this would be the case if we consider all points, change of tools, change of machinery in drawing pipe, carrying of two stocks, etc., and a hundred and one reasons could be put forth in favor of making 1½ inch waste pipes and traps the smallest, this to include traps, both brass, lead, and iron. All manner of fittings could be eliminated if every member of the trade were to give the matter some little thought and get in touch with manufacturers in regard to this problem.

Standardization and conservation are the measures that will do much to eliminate more waste than any thing else we can think of, and just so far as every Canadian takes thought of such problems, each will profit to an amazing extent.

Possibilities Ahead of the Gas Industry

Some Splendid Food For Thought For Every Sanitary and Heating Engineer — With Gas Consumption Increasing, the Sale of Gas Appliances Must Also be on the Increase

By GEO. W. ALLEN, Secretary-Treasurer of Canadian Gas Association

If any meeting held anywhere could have given gas men more encouragement as to the future of their industry, I would like to hear of it, for truly, this meeting of the Society of Civil Engineers had everything in it to encourage us to lay hold of that business which was practically in our grasp.

At the aforementioned meeting, it was pointed out that gas will play a very important part in the future of this and other countries. And even at the above meeting some of the electrical engineers present stated that the people of the country need not depend upon electrical energy ever being a solution of the heating problem, and to use electricity as a source of heat would be robbing the country of useful energy which would do double or triple more duty if used as motive power.

It was also shown that all the available water powers throughout Canada could not supply the electricity required to meet the maximum demand that might be created for heating purposes, even in a few of our large towns, let alone the great amount of energy required for power purposes on the railways, and in the industries of our land, not to say anything of the lighting loads.

Mr. V. H. Hannel, Chief of the Fuel Division of Mines, Ottawa, Canada, was one of the first engineers to open the meeting, and his paper on "The Fuels of Canada" was an interesting one. He said, "The fuel outlook was neither discouraging not gloomy if proper exploitation and economical use be assured."

The situation was difficult because Canada drew 55 per cent. of her coal from the United States, and also 91 per cent. of her oil products. Canada would, therefore, be hard pressed if there should be a curtailment of this supply. Mr. Hannel also pointed out that the central provinces of Canada had 12,000 square miles of peat bogs, and 16,000,000 tons of peat fuel, but owing to the great water content of peat, something like five times it own weight of water, the drying process was an expensive operation. He stated, however, that one of the efficient means of utilizing peat was in the production of gas, or else used in powdered form as a boiler fuel. Several engineers pointed out that almost all the bituminous coal mined or brought into this country could be more efficiently used if turned into gas and the coke produced sold for that purpose that could most efficiently use it, and that the gas be released for general house heating and other purposes at a low rate.

An eminent New York electrical engineer by the name of Thompson, speaking at this meeting of the Society of Civil Engineers, stated that the power possibilities of Niagara Falls were very greatly exaggerated, and that there would not be sufficient power at the Falls to supply anything near the requirements for heating purposes of only one city alone, say about the size of Toronto, so that the people need not look forward to the days when Niagara Falls would solve all its problems.

Engineers throughout the country have seriously, or are seriously, considering the part that gas will play in the future activities of our country, and for anyone to consider the possibility of doing away with the local gas plants is nothing short of foolishness. The trouble with most gas towns is that the local people concerned do not make any effort to put their gas plants into first class condition, considering it only a waste of money to do so, especially when these people consider it is only a matter of time when the gas industry will be a thing of the past. One has only to review the gas situation in a city like Toronto to see what can be done towards developing our industry and to realize what the future holds in store for those who make an honest endeavor to develop the business.

Toronto is not alone in this regard,



Gas fired annealing furnace for general use.



Gas fired annealing furnace used in shell manufacturing.

either, for there are now many cities where enormous developments have come about since action was taken towards encouraging the use of gas by the people generally.

As most of you no doubt know, the Consumers' Gas Co. of Toronto started its new business department ten years ago. It was at the time when the Hydro Electric development work was in full swing, and the newspapers were giving thousands of dollars worth of free publicity in its favor, and I feel sure that if the gas industry had had the publicity that was given to electricity at that time we would not have had to fear what the future held in store.

Although the Consumers' Gas Company had been in business for 60 years prior to the establishment of its new business department, still no real progress was made until the present management undertook to educate its consumers in the proper use of gas by showing them how to get the greatest use out of the gas for the money expended. Many plans were formulated and put into practice to enable the company to get more business, and the result has more than justified the time, money and effort expended.

Nine years ago the Consumers' Gas Company had about 55,000 consumers of gas, and this was the total number, after, as I said before, 60 years or so of busines, without any real effort being made during all that time to create greater outlets for gas. But during the past nine to ten years, with the new plans in force, and notwithstanding the extreme competition from the electrical men, and having also to meet extremely low electrical rates, in many cases down as low as ¾c per K.W. hour, has increased its consumers to the point where they now number around 111,000, more consumers for gas than the city itself has water customers.

The output of gas has also increased by leaps and bounds. From an average daily output ten years ago of around five million cubic feet of gas, the output has increased to nearly fourteen million cubic feet daily, and on many days during the past winter, owing to the local shortage of coal, the company helped out the situation by supplying additional gas for heating purposes, the output totaling, for all purposes, over seventeen million cubic feet of gas per day.

Hundreds and thousands of industries in the city of Toronto are now using gas for many purposes, and the campaign of education has proven that the use of gas is an economical solution of our fuel problems.

I believe almost all coals should be utilized in some form or other in the manufacture of gas and the proper solution of the heating and fuel problems of our country within the next few years will be in this direction if the country is to be saved from a very serious fuel famine.

If there were more gas plants scattered throughout our great country, especially among the larger cities, it would result in a great deal of fuel saving, and it would pay those cities, which have already gas plants, to spend more money for extensions, and for the development of new business. I am sure the result would more than offset the financial obligations involved. It would be a surprise to the people of many of our smaller gas towns if the gas were shut off suddenly and they were forced to purchase coal or electricity to make up for the loss. They would then find out that the gas company could more efficiently use the coal than could the people do so in getting the same results.

A gas plant in proper hands and kept in an up-to-date condition becomes an asset that no city or town would ever think of doing without.

The editor of the Belleville "Ontario" newspaper stated in a recent editorial that there were gas plants in Coborug, Napanee, and other towns, "that may be acquired, we have reason to believe, for nothing, by any person of financial responsibility who will agree to operate them." I had the pleasure of answering many of the points pertaining to the Belleville gas situation which were brought out by the editor of the "Ontario," and I stated in reply that the gas plants at Cobourg, Napanee and other cities with like conditions could not expect to be worth anything so long as those controling the situation in these towns (as in these instances, the Hydro Electric Department) were allowed to manage the affairs. For it stands to reason that if these business men have nothing before their vision but electricity they could not expect to see any good in the gas plant. I venture to say that these same gas plants in the hands of independent and go-ahead men would very soon need to be enlarged to take care of the demands for gas that would be created. The editor of the Belleville "Ontario," in his editorial, even went so far as to suggest to the special committee formed to investigate the local Belleville gas situation to debate the question, "Resolved, that the city gas plant should be abolished."

It is this kind of thing that we gas men have to contend with, and when such things do appear in the local press we should be ready and willing to take the matter up and discuss it on its merits.

The United States Fuel Administration in recent published advertisements, advised the people to use gas where ever possible for cooking and heating purposes.

The Advisory Council on Industrial and Scientific Research for Canada has been doing good research work throughout Canada, although handicapped through lack of efficient assistance, in an endeavor to solve some of the pressing problems of the day. In a paper read before the Canadian Manufacturers' Association meeting recently held in Montreal, Prof. A. B. McCallum says that they have given a grant for the making of straw gas on the western plains. He says, "there is somewhere between 20 and 30 million tons of straw from the wheat fields of Alberta and Saskatchewan that are wasted every year. Sometimes in September and October one sees the sky line ablaze with burning straw."

"That straw," he tells us, "Is an organic product that ought to be used," and it was proposed by Prof. McCallum and some others of the University of Saskatchewan that it should be used for fuel or for the making of gas to be used on the farm homesteads. He says, "A grant has been made for that purpose, but we have not reached any results yet, because it has been impossible to get the steel required for the demonstration plant we propose to instal on the farm. It has been done; this proposal has already been undertaken, and so at least there has been partially demonstrated the utility of it and we propose to have it demonstrated commercially. If we succeed, every farm house in Saskatchewan and Alberta may, for a small sum, $300 to $500, have a gas plant which can furnish it with gas for heating and lighting purposes throughout the year."

I mention Prof. McCallum's remarks on straw gas just to show that we can get gas from almost anything, and if all the men throughout the country interested in the development of gas, no matter what kind of gas it may be, were members of this association, I feel sure we could make great progress as an industry.

Mr. Waddie, of the Canadian Manufacturers' Association, in discussing the fuel situation at the Canadian Manufacturers' Association meeting, stated, in part: "Now we hear a good deal of reference made to peat, and to lignite, and I just want to say one word in that connection because I happen to have had connection with a lignite proposition a good many years ago—I think twenty years ago—and it was in Bohemia. I happened to be assistant manager of a plant in Bohemia in the north of Austria, where we had the lignite plant; that is we dug lignite out of the side of the hill and brought it down and we found this lignite, of which we have vast beds in Canada, was wonderful for the purpose of making producer gas. It is a large plant, it is a plant that is working against us now in foreign countries and working against us hard. This plant is run entirely by natural gas which is produced from lignite. All their heating and everything was done by producer gas produced from lignite. I may say it is a large steel plant."

(Continued in next issue)

MONTREAL CITY HALL TO SAVE FUEL

Not only that fuel and money may be conserved, but in accordance with the wishes of the Fuel Controller, Montreal City Hall is to be heated by a readjusted heating plant.

For some time there has been a large annex for the overflow departments of the city and it is now proposed to make alterations using the steam plant of the annex to supply the required heat for the old and new buildings. This will necessitate an outlay of nearly $20,000 and the annual saving is estimated at from $5,900 to $,000. It is understood that the special report of the chief engineer has already been acted upon and the necessary funds voted.



FACTORY SANITATION

Few managers of industrial plants realize the loss they are incurring by not looking more thoroughly into the merits of factory sanitation and welfare work.

By THOMAS STANSFIELD,
Sanitary Engineer

The employee is unborn who would not appreciate to the fullest extent such washing and sanitary conveniences as shown in above illustration. The owners of the plant in which this washroom is situated declare that it is a big asset in their business.

EDITOR'S NOTE

This series of articles is being published with a view of showing members of the trade how much more efficient labor can be made if sanitary appliances are provided for workmen. The articles are taken from actual experience and can be used as selling talks.

The average factory or workshop is a good prospect for every sanitary engineer. He should cultivate new, bigger and better business among the factory owners by showing how much more efficient workmen will be if adequate toilet and washroom accommodation is provided.

We are indebted to the Standard Sanitary Manufacturing Co., Pittsburgh, for the accompanying illustrations.

NOT very long ago the writer interviewed the director of the welfare work in connection with a large Canadian industrial plant, and one of the most important matters dwelt upon was, of course, sanitation in all its branches and its value to the general well-being of the whole organization. "There is just one thing I am thankful for," said this man, "and that is that I have a general manager over me who is thoroughly in sympathy with the welfare department in this institution. He is one in ten thousand. His motives are not altogether selfish as is the case with some managers. He believes from the bottom of his heart that contented and healthy workmen actually do put more into their work than the firm pays the employees for. Because of this, the welfare department of this particular concern is not a bill of expense, but is actually a valuable asset."

Continuing along the above line the writer learned that very elaborate plans were being worked out to provide a gymnasium club, the building for which is already being equipped with all kinds of necessary appliances, that a plunge bath will be furnished for the workers and a number of other facilities for contributing to the welfare both physically and mentally, of every person employed.

Lunch Room Accommodation

In many plants the toilet rooms, wash rooms, emergency rooms, as well as locker rooms and drying rooms are grouped together in one large centrally situated building, which takes on the nature of a private convenience station; and in this building too is found a paying investment to include a kitchen and lunch room, with tables, the tops of which are made of non-absorbent material and easily kept clean. Chairs or benches are provided where workmen can eat their meals and rest in clean, pleasant, and comfortable surroundings. A number of good books, daily papers and magazines are provided, and men can read, smoke, or talk during their spare time.

Many concerns provide coffee, soup, or even more elaborate meals, feeling convinced that the better men are fed the better will be the output of the whole plant. Moreover, such food is chosen as best fitted to the men according to the occupation followed.

The advantages of a well ordered lunch room are manifold. Instead of the employees rushing off to a nearby lunch room where food is prepared in slapdash, haphazard ways, food very often unsuited to the men's needs, and loading up with a cargo of "false energy," which really leaves a person worse off in a short while, these employees can rest comfortably and consume food prepared to suit the occasion, food which contains



A simple type of washing and locker accommodation.

and produces real energy, which can be turned into manufactured products.

As sanitation and hygiene are the very fundamentals of good health and right living, they have just as important a place in the factory and workshop, the mine or the forge, as in the home.

Drinking Water

Water is as necessary to workmen as it is to a boiler, and clean water is necessary to both, but it is most important to have perfectly pure water for employees just as it is necessary to furnish soft, clean water to a boiler. It is a well established fact that there is far more disease carried in the water we drink than in the air we breathe. Water may be perfectly clear and sparkling, yet far from fit to drink, and as every employee kept from work by sickness means a direct loss to the business, it becomes a matter of economy to provide cool, pure drinking water which is absolutely above suspicion, and that will not be likely to cause any kind of disease or epidemic.

If a plant is situated in a town or city which has a public water works, and the water is filtered, the problem of water supply is not, in many cases a very serious problem. Though in small towns, or even large ones where the sewers are allowed to discharge in too close proximity to the intake pipe to pumps furnishing water to the mains, the management will do well to have independent tests taken every once in a while, particularly in spring and fall. or when there are strong winds which will be liable to change the flow of the stream from which water is pumped, so as to cause the sewage to come in contact with the water being pumped for the citizens' use.

At the time of writing a flourishing town in Ontario is just recovering from an epidemic of typhoid, which has not only cost several lives but has resulted in thousands upon thousands of dollars loss to manufacturing industries situated there.

However, to steer clear of such trouble occurring in a factory, the management would do well if they furnished filtered water, cooled as well. Appliances can be procured that will do both, and the cost is not out of proportion to the service and safety provided for the workpeople employed.

Sanitary Drinking Fountains

Having a good supply of water, water of course that is pure and wholesome, the next problem is to so distribute it that workmen will have it close at hand, thus eliminating as far as possible any unnecessary loss of time travelling to and fro when in need of a drink. In factories men come from all parts of the city, meet and mingle for a few hours, and then scatter to their homes again; and if one is affected with a communicable disease and uses vessels that are used by other, an epidemic of that disease is liable to break out and spread, not only throughout the factory but also to the entire town or city, thus crippling the plant and resulting in great loss to the management. By far the most common carrier and spreader of disease is the drinking cup. Thousands of persons have contracted incurable and loathsome diseases as a direct result of using a public drinking cup, after it had been used by an infected person.



Change rooms showing steam racks for d rying clothes where employees change their sweat-soaked clothes—plenty of light and ventilation provided, see steel lockers on each side of room.

Tuberculosis and other diseases can and have been traced as having been transmitted in the same way.

So that there exist both sanitary and economic reasons for the abolition of the common drinking cup from the factory, workshop and office.

Sanitary drinking fountains of the bubbling, or sip and swallow type as they are sometimes called, can now be had in almost any desired design, operated in many ways; fountains that can be attached to an ordinary wash bowl or to separate pedestal. Some types are adjusted so as to be bubbling all the time, while others can be operated by either a hand or foot lever.

Water is rather insipd in warm weather when it is needed the most, if it is warm, and a great deal is wasted drawing off a large quantity to see if it will not get cooler. This waste of course is an expense to the management, and can be prevented, or at least offset, by providing a cool water for drinking purposes. Ice water on the other hand is not desirable, but a happy medium must be struck between the two extremes. Water coolers will be necessary for this purpose. In large compact factory buildings, a water cooling plant of the mechanical refrigeration type can be installed, and the cooled water supplied to the several floors through well-insulated pipes. A small rotary pump will keep the water in circulation, flow and return pipes being provided so that cold water will be on tap as soon as a faucet is opened.

In large plants occupying several buildings and spread over several acres



In providing change rooms the management of this factory makes it possible for their employees to change their work clothes after the day's work is done. This allows work people to return home in clean clothes, looking more like free born citizens, not garbed in distinctive trade attire.

of ground, the drinking fountains, like the water closets and urinals, should be scattered over the premises so they will be available without loss of time. Wherever a bubble fountain is set up under such conditions a separate cooler will be necessary, as it would not be economical or practical to pump cooled water to all parts of the plant from a central station on account of the expense for insulation, or alternative of great loss of cold; or heating of the water in the circuit.

The most practical solution of the matter then, is to have a coil of pure tin pipe in an ice chest or cooler near each fountain, to cool the water as used. These cooling coils may be placed in any convenient place or in an ice cellar built in the ground alongside of the fountain, free from contamination, and covered with an iron cleanout manhole cover, Pure water, sanitary service, and an economic distribution, then, may be taken as three very importane requisites in the supply of cooled drinking water for the employees of a factory, workshop or any other kind of building.

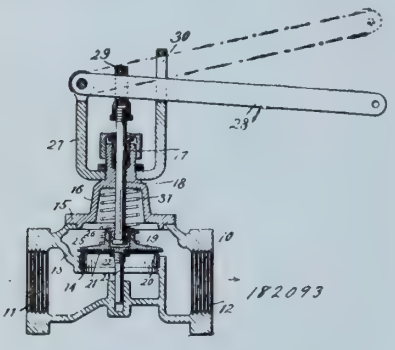
(To be continued)

New Canadian Patents

No. 182,093.

The Bryant Heater and Manufacturing Company, Cleveland, assignee of Otto Fox, Lakewood, both in Ohio, U.S.A., 5th February, 1918; 6 years. Filed 7th December, 1917. Receipt No. 288,435.

Claim.—1. In a valve, a valve body having inlet and outlet passageways and a partition between the same, a valve seat carried by the partition, a valve carried on the seat and adapted to move outwardly therefrom, the seat and valve having one a sharp edge and the other a soft non-metallic facing into which the edge is adopted to be imbedded, a spring engaging the valve and normally press-



No. 182,093. Gas Valve.

ing the same on the the seat, a valve stem for opening the valve and having a lost motion connection therewith, said lost motion connection preventing the seating of the valve by pressure applied through the stem whereby the valve will be seated and the sharp edge will be embedded in the non-metallic facing solely by the pressure provided by the spring.

2. In a valve, a valve body having inlet and outlet passageways, and a partition between the passageways, a valve seat carried by the partition, a valve adapted to be seated on the seat, said valve and seat one having a soft facing and the other a hard sharp edge adapted to be imbedded in the facing, said valve body having an extension at the top thereof, a spring between the extension and the valve, a valve stem guided for movement in said extension, the top of the valve having an enlargement with which the lower end of the stem has a lost motion connection, and means limiting the movement of the stem relative to the valve whereby the valve will be seated solely by the pressure created on the valve by the spring.

3. In a valve, a valve body having inlet and outlet openings and a partition between the same, a circular valve seat provided with a sharp outstanding edge carried by said partition, a valve provided with a soft facing in which the seat is adapted to be imbedded, a spring between an extension of the valve body and the valve and serving to normally seat the valve, a stem guided in said extension and having a lost motion connection with the valve, a valve operating lever pivotally supported on said extension, the lever having a connection with the stem by which the stem may be raised and lowered, and means forming for limiting the movement of the lever in both directions, the stop limiting the downward movement of the lever preventing pressure being applied through the stem to seat the valve whereby the valve is seated solely by the spring.

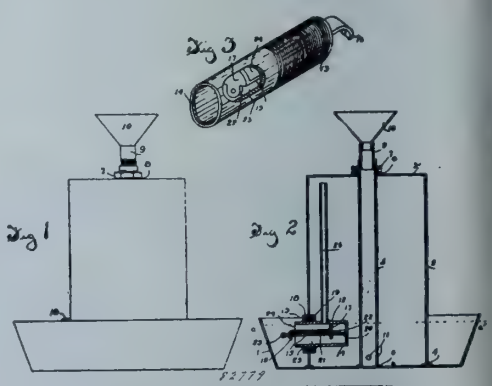
No. 182,779.

Nazaire Bazinet, Winnipeg, Manitoba, Canada, 12th March, 1918; 6 years. Filed 13th November, 1917. Receipt No. 287,545.

Claim.—1. The combination with a drinking pan, a closed liquid storage tank mounted in the pan, and a filling tube passing through the tank and opening to the interior thereof at the bottom, of a combined air and water pipe located in the side of the tank and below the top level of the pan and having a cross partition therein providing a top air passage and a lower water passage, an air tube communicating with the air passage and terminating adjacent the top of the storage tank, a valve seating on the inner end of the combined air and water pipe, and means for manipulating the valve from the exterior of the tank.

2. The combination with a drinking pan, a closed liquid storage tank mounted in the pan, and a filling tube passing through the tank and opening to the interior thereof at the bottom, of a combined air and water pipe located in the side of the tank and below the top level of the pan and having a cross partition therein providing a top air passage and a lower water passage, an air tube communicating with the air passage, and terminating adjacent the top of the storage tank, a valve seated on the inner end of the combined air and water pipe and a slidably mounted valve rod secured to the valve and extending through the pipe and terminating at the exterior of the tank.

3. The combination with a drinking pan, a closed liquid storage tank mounted in the pan, and a filling tube passing through the tank and opening to the interior thereof at the bottom, of a combined air and water pipe located in the side of the tank and below the top level of the pan and having a cross partition therein providing a top air passage and a lower water passage, an air tube communicating with the air passage and terminating adjacent the top of the storage tank, a valve seated on the inner end of the combined air and water pipe, a lug located on the lower side of the partition, a down-turned lip provided at the forward end of the partition, and a valve rod having the inner end secured to the valve, the body portion thereof slidably mounted in the lip and lug and the outer end thereof terminating in a knob projecting into the pan.



No. 182,779. Drinking Fountain.

FORTY YEARS MORE

Harry Lauder paid a visit to the western front some time ago. While standing before a great barbed-wire barricade he asked a Highlander how long he thought the war would last. "Forty years," said the Highlander, never moving an eyelid. "We'll be fighting another year, and then it'll tak' us thirty-nine years more to wind up the wire."

YOUR "UNCLE SAM" IS NOT A BLUFFER

Written by George A. Simpson, Sales Manager, The Steel Company of Canada, Limited, Hamilton, Canada, who wrote "Hundred Point Men," "Salesmanship From a New View Point," etc.

NOTWITHSTANDING the following, which I clipped from a Canadian paper, your "Uncle Sam" is not a bluffer, and this the Hun will find out to his sorrow:

Washington, July 9.—Publication in Swiss papers of the text of Secretary of War Baker's letter to President Wilson, giving the American troops' movement to Europe by months, caused German authorities to permit its publication in Germany, according to a despatch received from Berne.

The *Koelnische Zeitung* published the latter under the heading "American Bluff," the despatch says, and commented as follows:

"Mr. Baker thinks he will be able to dissipate all doubts about exactitude of his figures with his recitations. It is, however, only the usual American bluff. We know from reliable sources that the figures in question are inordinately exaggerated and in no way correspond to the truth."

And furthermore, he will understand—if he does not already know—that the figures furnished by Secretary of War Baker are not "inordinately exaggerated," but they do correspond to the truth inasmuch as they only represent a small fraction of the force that will be exerted by Uncle Sam for the cause of humanity before the allied armies reach Berlin.

A Nation of Enthusiasts

The American is an enthusiast, fostering an ambition unbridled by traditionary restraint, for in him commingles the souls of the sturdy Pilgrim Fathers, beset with the cares of existence, conquering nature, felling trees, navigating rivers and fertilizing valleys, and the souls of the Colonists fighting for liberty and independence. He is the child of a country as boundless as the ocean, whose rivers are like rolling lakes, and the lakes like inland seas, the forests, the mountains, the plains, Niagara itself with its world of waters—all owe their magnificance to their immensity; and by transference, not unnatural although fallacious, the Sons of Uncle Sam have modelled their ideas and expressions on the huge scale of their magnificent country, and history proves that anything they have seriously set themselves to do. they have successfully accomplished. But this is to their credit, as nothing great has ever been accomplished without enthusiasm, but they are not bluffers.

It is true, and I must admit that the words "bluff" and "bluffer" are often applied to American statements and to those who make them. As to why they should be applied to the extent they are, I am at a loss to understand, unless it is through the application of a mental attitude that parallels, in a sense, that of the German toward the English. During the course of the war, I have been asked a number of times by residents of the United States what has England done to incur the hatred of Germany—as no one seems to question that a deep-seated hatred does exist—and to those who first propounded the question, I was at a loss to make an answer. Therefore, I undertook to analyze the subject and I asked myself the question, "What has England done to Germany?" and for the life of me I could not reach any logical conclusion, other than the one I will later outline which justifies in the German mind the Song of Hate, or the toast of "Der Tag" which, in English, is "The Day," meaning the day on which they could pick a fight and thereby show their brutal superiority over a race that they recognized, but would not admit, were their superiors in every commendable particular. I have therefore concluded that their hatred is caused by a mental attitude, born of the fact that the Englishman is a gentleman and as such is recognized by every nation with whom he comes in contact.



Mighty Handy With a Knife

I have before me a mental picture—not altogether imaginary, as I have attended gatherings where different nationalities have sat at the same table—and I can see the German, fat and coarse, with his napkin tucked inside his collar, disposing of his soup with musical accompaniment, using his knife and fork with the same elegance that a plumber would use his tools; in fact, the knife is more to his liking than the fork. I have watched him through the meal, ill at ease, feeling that he was not in harmony with the thought and environment of representative men. I have seen him called on to make a speech, or responding to a toast, rising awkwardly and even where he could speak good English, it sounded to me like someone gargling their throat. In other words, the German is coarse; he is the offspring of a race of butchers, soap-boilers and brewers, and he knows it and shows it. On the other hand, across the table the Englishman, respecting all the good manners recognized in well-ordered society, is called upon to respond to a toast, and with the grace of a Chesterfield, he rises to the occasion and in a few well-selected words, he makes his response. The German knows he is not the equal of the race from which this gentleman sprang, and therefore dismisses the subject by saying under his breath "Englander Schwein."

But the English are not swine, neither is your Uncle Sam a bluffer, yet a state of mind has been created and does exist all over the world, including Canada, which prompts the dismissal of a statement, involving big figures or vast undertakings, made by an American, as "American bluff." To this I have applied the test and I

wish to go on record and state in the most emphatic language that all through the history of the United States I cannot find one instance where statements have been made which I will admit, sounded like "bluffs," that have not been fulfilled. And I can only conclude that the reason the word "bluff" or "bluffer" has been applied by the people of every nation who do not realize the stride your Uncle Sam is making, is because they cannot grasp the magnitude of the statements made and they dismiss the subject as "American bluff," while those who do realize it, resent it with the same remark.

Their Declaration of Independence, whereby they severed their allegiance from a crazy German king, sitting on a British throne, was no bluff; neither was the Emancipation Proclamation, which gave freedom to the slaves, a bluff.

Couldn't Grasp the Idea

As a slight indication of the extent to which the word "bluff" or "bluster" has been applied to the inventive minds and the unbridled energy of the American people and as to how poorly it served as descriptive of their accomplishments, I may state a little incident that I well remember and have many times repeated. I was standing on the railroad platform in Newport, Monmouthshire, awaiting a train to take me to my home. I was then a boy, attending a British Public School. There were a number of other passengers waiting for the same train, among them being the vicar of the parish of Trevethin, the Rev.. J. C. Llewelyn, a well known and renowned clergyman of the Church of England. He was talking to some farmers, who lived in his district, and the conversation ran about as follows: He told them that he had received a letter from a former member of the church, who had emigrated to America, stating that there had been invented and there was now in use in the United States a machine that while being drawn through the field, would cut the wheat, put it up into sheaves, bind it and drop it, ready for being put into shocks, as it went along.

The conversation was interesting to me as, boylike, I had profound respect for the vicar. I now recall the expression of doubt on the faces of the farmers, and the smile from the vicar who acquiesced with their thoughts, and I can now hear him distinctly stating that he very much doubted that such a machine could be made and applied in general use, with which the farmers, who were at that time cutting their wheat with a sickle, were very much in accord.



GEORGE A. SIMPSON

When we consider what the sons of Uncle Sam have done for the agricultural world and realize that their first attempts were classed as "bluffs," we can more fully appreciate how ridiculous and uncalled for the expression is. And what applies to the endeavors of Uncle Same in the production of agricultural implements applies to everything he has seriously undertaken.

As a boy I went to sea in an English sailing ship, and I remember very well my first introduction to what I then considered "bluff." We had crossed the Atlantic from England to the West Indies with a cargo of coal and had run down to Pensacola, Florida, for our return cargo of lumber. After we had discharged our ballast, we were towed out into the bay where our complete cargo of logs had been rafted and was there awaiting us. I remember hearing the stevedore, an Irishman, by the way, by the name of Pendleton, who had lived the best part of his life in the United States, telling his gang that he expected to load the ship in about three days. While I was a very young boy at the time, I shook my head and if I didn't say "bluff," I thought it. Notwithstanding we were loaded and ready to sail within the prescribed time and we arrived in England some ninety days later, where it took the English stevedore and his force some four weeks to unload what the American gang had loaded in a little over three days. No bluff about that.

Some years later I was on the Isthmus of Panama. It was shortly after the collapse of the French company, who had undertaken to build the canal All the machinery and equipment was lying in idleness and rusting. The isthmus was reeking at that time with yellow fever and disease, and any man who spent much time there took his life in his hand. I was then advised it was impossible to build the Panama Canal, and to drive home this statement, my advisers, pointing to Monkey Hill, which in those days was the famous burying ground of the workers on the Isthmus, said there were more men buried in the cemetery on that hill than there were ties in the Panama railroad. In later years Uncle Sam undertook to "dig the ditch,' and the first thing he did was to clean up the Isthmus from ocean to ocean. The greatest sanitary engineers in the world were put on the job under the direction of Surgeon-General Gorgas, the man who cleaned up Havana, and when this part of the work was done and the Isthmus made fit for a white man to live on, that great organizer, Major Goethals, the canal builder, was ordered by President Roosevelt "to make the dirt fly." As to how well he did this work is now a matter of history; but the facts are the work on the canal, especially any reference to the gigantic dredging operations, were often referred to as American bluff, and when the date set for the completion of the work was mentioned, it usually brought forth the stereotyped reply, "bluff." Nevertheless, the canal was completed and ships passing through it fifteen months prior to the official date set for its completion.

If my memory serves me right, it was in the year 1890 that the British Iron and Steel Institute visited the United States as guests of the American steel manufacturers. At that time I was associated with the T. A. Gillespie Co. We were laying natural gas pipe lines into the city of Pittsburgh and some of our construction records had evidently reached England. When the members of the Institute reached Pittsburgh, it was my pleasure to take charge of a party of six to conduct them through the steel mills at Homestead and, incidentally, outline to them what was being done in connection with the bringing of natural gas

into the city. In my party was the president of the Institute, Sir E. Windsor Richards of Middlesboro, Mr. Clement Crowther, of Crowther Bros., Kidderminster, and Mr. Isaac Butler of the Panteg Steel Works, in whose mills I had worked in England, also a number of others, all of whom were descendants of families long connected with the iron and steel industry.

I recall now the statements they made on going through the mills and their utter amazement at what they termed "the gigantic buildings" and what in their minds was the enormous output, which these mills were producing. They told me then they had heard of these big undertakings, but had discounted them very largely, as they thought it was merely "American bluster," but they were satisfied that what they actually saw was greatly in excess of what had been reported.

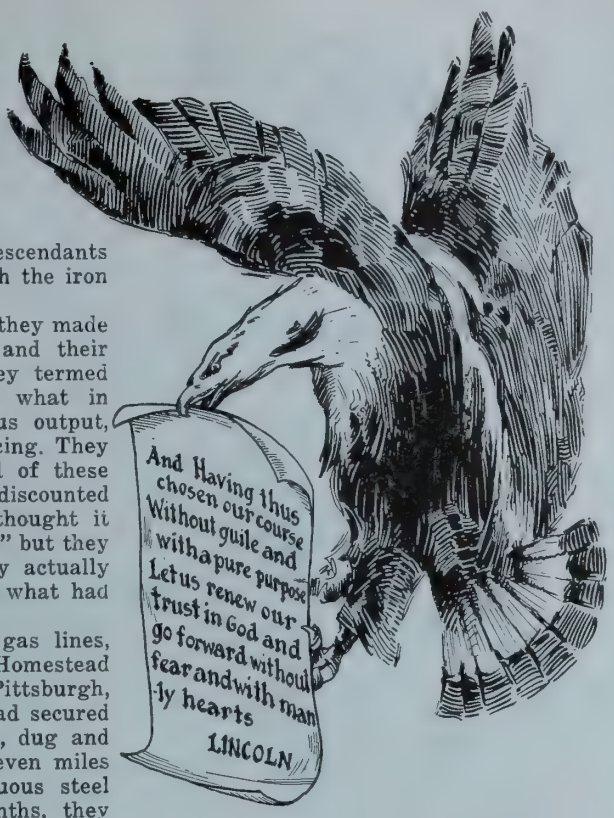
When I showed them the gas lines, which passed very close to Homestead before crossing the river into Pittsburgh, and stated to them that we had secured and cleared the right of way, dug and filled in the ditch and laid eleven miles of 36-inches diameter continuous steel piping in less than five months, they were astounded and Mr. Crowther remarked that at home (meaning in England) they would not have concluded the debate in Parliament in that time as to whether the right of way should be granted or not.

Making of Tin Plate

It was just about this time that the subject of manufacturing tin plate was being considered seriously in the United States, and I so advised these gentlemen, and while they were willing to admit that all the statements that had been made in reference to pig iron and steel had been more than fulfilled, nevertheless it was not possible in their mind for any one to take Great Britain's place in the production of tin plate. They were inclined to jokingly infer that my statements in connection with this industry bore a little resemblance to "bluff." I may state that to-day the United States leads the world in the production of tin plate, likewise pig iron and iron and steel.

There was no question as to the effect of what they saw on the minds of the members of the British Iron and Steel Institute, or as to the benefits obtained through their visit, as they all returned singing the praises of your Uncle Sam and voted unanimously that he was not a "bluffer." And on the Americans, who had come into contact and associated with this magnificent body of representative Englishmen, the impression was indelibly stamped that they were gentlemen in every sense of the word.

I could go on indefinitely reciting statements that were regarded as "bluff," but which were fulfilled to the letter. While the Alfonsos and Isabellas sneered at what they termed "American bluff," your Uncle Sam was not bluffing



when he lifted the heel of Spanish tyrranny from the neck of the Cuban and cleaned up the Island of Cuba and dredged the harbor of Havana and thereby got rid of the filth of centuries, which made this beautiful island a hot bed of bubonic plague and yellow fever. As a result to-day there is no more beautiful spot on the Western hemisphere than the Island of Cuba and the city of Havana. It is true, while doing his work, he lost by death, through yellow fever, an eminent sanitary engineer, but he completed the job and made good his wildest statements. And what is more—he paid the bill and to-day Cuba is proud to be recognized as a protege of Uncle Sam.

The Boxer Incident

And while I am referring to paying bills, I might state that during the Boxer Rebellion in China, when the six big nations of the world undertook to quell the disturbance, they all went in with the understanding that China would pay full indemnity for every expense incurred in the undertaking. After the work had been accomplished and the civilized nations had withdrawn, which, by the way, does not include Germany, as she stuck and took possession of Tsing Tau Peninsula and refused to be dispossessed, maintaining that she was holding this possession as payment for the expense she had been put to, they rendered their bills—which ran into enormous figures—and all of them are being paid with the exception of the one rendered by your Uncle Sam, which he presented to China marked "paid in full," with thanks for the privilege of being given an opportunity to render such a service to humanity. Surely this is not "American bluff."

The feeding of Belgium in the early part of this war was no bluff; neither is the feeding of the Allied armies to-day, or that part that your Uncle Sam has played in this great war from the beginning. Referring to the feeding of the armies to-day, I am reading from an address made by Sir William A. M. Goode, an officer of the British Food Ministry, before the Consumers' Council, in which he gave striking figures, showing how the people of the United States by self-imposed food restrictions have aided greatly in maintaining the food supply of the armies in the field. Sir William said:

> "From July, 1917, to April, 1918, the United States exported to the Allies 80,000,000 bushels of wheat products. It was calculated by Herbert Hoover, United States Food Administrator, that fifty million of this represented the voluntary sacrifice of the American people. American exports of pork products to the Allies in March, 1918, were 308,000,000 pounds. This was accomplished by porkless days and ceaseless hog production in the United States. In January, Sir William continued, the Allies asked Mr. Hoover for seventy million pounds of frozen beef monthly for three months. In March 86,000,000 pounds of frozen beef were shipped. This was due almost wholly to meatless days in the United States."

Had this statement been made by an American, it would, no doubt, have been dismissed as "bluff."

I would like to furnish some more figures and I would if space permitted, but suffice to say it required more than bluff to supply Great Britain and France with over 1,500,000 horses and mules; millions of tons of steel and shell forgings, hundreds of thousands of tons of barbed wire, and tens of millions of completed shells, machine guns, revolvers, together with hundreds of millions of pounds of powder and cordite to assist in delivering these shells into the ranks of the Germans by way of British guns. Add to this the enormous quantity of machine tools and equipment that was shipped to England and France, which enabled them to speed up and take care of their own requirements. Add to these transports, trench diggers, tanks, automobiles, medical supplies, clothing, shoes—in fact, mountains of supplies—that were absolutely necessary for the very existence of the allied armies in the field. We grant he was paid for all this, but that he was entitled to. What I wish to bring to your notice is the magnitude of this undertaking and the manner in which it was carried out, and many times during the early period of the war I heard statements made by these American producers, who had undertaken this magnificent work, referred to as "American bluff."

Some 1918 Accomplishments

The building of the Liberty Mill at Homestead in six months for the rolling of ship plates, the construction of a one-

hundred-million-dollar ordnance plant on Neville Island in the Ohio River, near Pittsburgh; the building of shipyards from ocean to ocean with seven hundred and twenty ship-building berths and the launching of ninety-four ships on the Fourth of July are merely incidents in the vast war programme mapped out by Uncle Sam. Yet any one of these undertakings is stupendous. They form parts of the American war machine, and you can take it from me that when this force gets properly started, there is no power on earth can stop it. It is no bluff; it is Uncle Sam's contribution to a righteous cause, and shoulder to shoulder with his Allies, he will drive this machine across the Rhine.

While I know from experience that the great majority of Canadians fully realize and appreciate that Uncle Sam is a good neighbor and that he is not a bluffer, I also know there are small cliques of narrow-minded individuals in Canada, who are earning their Iron Crosses and doing good work for the Kaiser by sneeringly applying to all things American the word "bluff" and thereby attempting to discount their most sincere efforts. Such individuals should, in my judgment, be reported to the proper authorities, where they would be given an opportunity to prove whether their remarks were merely expressions of their personal opinions, or whether they were paid for with German gold.

The Wrong Viewpoint

An incident I shall ever remember and long regret happened on a train some months ago. I was sitting in the parlor-car. We were leaving Hamilton, going to Toronto with a friend, and across from us sat the president of a large Canadian manufacturing company. He was reading a Buffalo paper and evidently some of the headlines did not please him. Handing the paper to me, he pointed to an article and remarked: "What do you think of that American bluff?" The article referred to a loan of a few billions to the Allies and incidentally spoke of helping to deliver the punch that would knock out the Hun. I saw nothing objectionable in the article and called his attention to the fact that he was reading an American newspaper, and I further stated that, in my judgment, the help we would get from Uncle Sam was necessary and that had the United States not entered the struggle to take the place of recreant Russia, Germany might have forced a peace of her own devising upon the Allies, to which he objected, stating definitely that he would rather see the Allies beaten than have that bluffer take any of the credit. The cruelty of this remark was sufficiently effective to stun both of us, to whom it was directed, and while we felt like beating him up, or handing him over to the police, we ignored him; but not without taking his mental measure and concluding he was either crazy or profoundly pro-German, preferably the former.

I fully realize that Canada could exist without her neighbor; but it would not be a very modern existence, neither would it be a very progressive one. But I also realize that we can get along much better with the United States than without. We are absolutely dependent on Uncle Sam for a whole lot of our comforts. Take hard coal for one—yet notwithstanding there was a great shortage last year due to the war, it is a fact, the homes of Canada were more comfortably heated than the homes in the United States, and I know that the orders from Washington relating to the distribution of certain materials were positive, as a prominent official there told me that Canada was being treated as one of the States. This spirit prevails and governs the actions of Uncle Sam in all his dealings with Canada.



Canadians should not forget that Anglo-Americans wrote the Declaration of Independence and the Constitution of the United States; they produced George Washington, Abraham Lincoln and Woodrow Wilson; they were the makers of trails and the givers of laws; they opened up the American wilderness; they drove the roads and bridged the streams and the roads they drove were straight and the laws they gave were broad and kind, and to-day the eyes of the world are looking west for they know that your Uncle Sam is not a bluffer. They are beginning to realize what America stands for.

Finally, I ask for no more sincere and representative corroboration of the truth of my statements than the tribute recently paid to your Uncle Sam by the Earl of Reading, British Ambassador to the United States, which follows:

Associated Press Despatch.

LONDON, Aug. 14.—The Earl of Reading, British ambassador to the United States, in a lengthy statement to the press, details America's war work as he has observed it during the last six month.

"If I speak in terms of enthusiastic admiration it is because none other would convey my thoughts," he says.

After discussing America's achievements in feeding the Allies and building ships, Lord Reading continues: "In no direction, however, is the spirit of the whole-hearted co-operation more striking than in the magnificent contribution of America to the man-power of the Allies. When in the grave anxieties of the end of March at the request of the prime minister and the cabinet I asked the President to order without delay the acceleration of his despatch of American troops and to allow them to be trained and used with the British and French, his only limitation as to numbers was the shipping capacity to carry the men.

Gave Allies Initiative

"It was an historic moment which may in the future be regarded as the turning point of the war. Both the British and French nations were quick to appreciate the spirit of this contribution made so promptly and at so opportune a moment. It has proved of such value that Marshal Foch has been able to meet the great German attack by an Allied counter-offensive and has not only wrested the initiative from the enemy, but has gained important victories.

All Resources Thrown In

"Since America has acquired knowledge of the situation her material resources, financial wealth and the brains and force of character of her millions, in fact all the physical and moral forces of this giant among nations are turning in one direction—to the attainment of victory. Americans are idealists but they also are business people.

"Having realized what victory and failure will mean to humanity, with their characteristic single mindedness and power of concentration they are making the winning of the war their only business and, if I know anything of them, having undertaken the task they will persevere until their object is achieved.

"I wish I could adequately convey to the British people the warm-hearted generosity of my reception as British ambassador by the American people. It is given me as British representative and is an expression of the admiration of Americans for the part played by the British people in this war. Prejudices are giving way to a better under-

(Continued on page 34)

Market Conditions and Tendencies

Statements Regarding the Prices and Trend of Supplies.

THE MARKETS AT A GLANCE

HIGHER prices have been provided for in new discounts issued on cast iron soil pipe and fittings. Restricted output, lack of raw material and labor conditions are factors contributing to this action by the manufacturers. In view of these conditions it is considered inadvisable to make any bookings ahead—in other words, if this commodity is required for a specific purpose it should be purchased and taken into stock to insure delivery.

A further decline of from 5 to 10c per pound has been noted in tin since last issue. Trading is rather limited owing to uncertainty still prevailing re Government action. First advices intimated that the United States were to get two-thirds of the available supply. Now there are indications that the British Government may handle the entire product, appointing one importing firm as their agent. This would probably work out to best advantage as a more accurately gauged basis of the available supply could be secured and allocations made to essentials in the order of their importance. Solder is down 1c per pound in sympathy with lower prices of tin.

The outlook for a supply of plates seems somewhat brighter, and some movement of black sheets is now in progress. Galvanized sheets are very scarce, some gauges being unobtainable. The whole outlook commercially is by no means bright, the War Trade Board at Ottawa showing a marked disposition to eliminate all orders not labelled for essential war industries.

An advance of $1 in closets has been made. Other lines of enamelware are unchanged, though ruling with a very firm undertone. Plumbers' oakum has advanced $1 per 100 pounds in some quarters.

New prices on wrought pipe are now available along basis noted in SANITARY ENGINEER last issue. It is apparent steel pipe is increasingly hard to get, and greater dependence must be placed on genuine wrought iron.

TORONTO, September 28.—Higher prices have been reached on soil pipe and fittings during the week. The revised quotations on wrought pipe are also available now and published herewith. Solder has declined another cent following a drop in the tin market. Lead is very firm, shortage of supplies becoming increasingly apparent as it affects commercial enterprises. Business is considered satisfactory.

Range Boilers Holding Firm

RANGE BOILERS.—The scarcity of sheets and the recent advances in price are factors providing a firm undertone to the situation in range boilers. No change in price is yet apparent, quotations herewith being firmly held:

	Standard	Extra Heavy
30-gallon range boilers	$14.00	$17.00
35-gallon	17.00	20.50
40-gallon	20.50	24.00
52-gallon	28.00	32.00
66-gallon	37.00	42.00
82-gallon	45.00	50.00
100-gallon	62.00	70.00

Closets Make $1.00 Advance

ENAMELWARE.—An advance of $1 on closets, bringing the oak tank and seat to $25 has been made since last issue. Other lines, tubs, sinks, etc., are unchanged though ruling with a firm undertone. A very fair movement of all lines is now apparent.

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs 5½ ft.	35 70
Sinks, roll rim, 18 x 30 in., staple	16 80
Closets, oak tank and seat	25 00
Do., enamel iron or white vitro tank	27 00

Sharp Advance in Soil Pipe, Fittings

SOIL PIPE, FITTINGS.—Owing to restricted output, lack of raw material and labor conditions, a sharp advance has been made in cast iron soil pipe and fittings dating from September 27. In view of said conditions it is considered inadvisable to make any bookings ahead—in other words, if this commodity is required for a specific purpose it should be purchased and taken into stock to insure delivery. Quotations are now based as follows:

SOIL PIPE AND FITTINGS

Medium and extra heavy soil pipe, 2 in. to 6 in.	15%
Medium and extra heavy fittings, 2 in. to 6 in.	25%
8in. soil pipe and fittings	Net list

C. I. PIPE FITTINGS.

Cast iron fittings	Net List
Plugs	15%
Bushings	18%
Flange unions, standard	Net List
Dart unions, ¼-inch to 2-inch	15%
Do., 2½ in. and larger	6½%
Nipples, up to 4-inch	45%
Do., 4½-inch and larger	40%
Do., running thread 4-in. and under	25%
Couplings, 4-in. and under	35%
Do., 4½ in. and larger	15%

MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittgs., Class A, lb.	.60	.75
Do., Class B., lb. net	.27	.37
Do., Class C., lb. net	.19	.27

Valves Hold Firm, Unchanged

VALVES.—The market is strong, prices ruling very firm though unchanged. Trading is considered satisfactory though not exceptionally heavy:

	Discount off list
Ground work	42
Compression work, standard	47
High grade	41
Cushion work	40
Fuller work, standard	45
High grade	38
Basin cocks, No. 0 standard	40
Nos. 1 and 2	40
Bath cocks	50
Flatway stop and waste cock, standard	50
High grade	47
Roundway stop and waste cocks, standard	50
High grade	47
Brass steam cocks, standard add 10%.	
Globe, angle and check valves, standard.	Net
Do., removable seat	Add 5%
Radiator valves, standard	10
Do., removable seat	Net List
Patent quick opening valves	30
Basin Cocks—	
No. 0 and 1, Fuller pattern	45
Globe, angle and check valves, standard, medium pressure	20
Radiator valves, standard med. pressure.	30
Radiator valves, removable seat, medium pressure	25

Plumbers' Oakum Up $1.00; Waste Strong

WASTE, OAKUM.—An advance of $1.00 per 100 pounds has been made in plumber's oakum, making lowest quotation $10.00 per 100 pounds. Sales of all grades are maintained at a high average and indications are that manufacturers have increased their output to keep up with heavy demands made upon them.

Sales of waste continue along very satisfactory lines, and a good volume of business is reported. Prices are very firm but hold unchanged.

	Per 100 lbs.
Best American	$21 00-$22 00
Clipper, spun	21 00
Do., unspun	10 50
Plumbers', spun	10 00- 10 50

Boiler Tubes Scarce; Buying Limited

BOILER TUBES.—At the present time stocks of the larger sizes particularly are very very scarce—in fact it is intimated absolute suffering is being occasioned by the actual shortage. That more will come is fully expected, but their arrival is not looked for under four to six weeks' time. The demand is not too heavy, only essential industries showing a disposition to buy. There are still some small tubes available, recent shipments not yet being fully absorbed. Prices are unchanged at following levels:

BOILER TUBES—	Cold Drawn	Lapweld
1 inch	$36 00	$.....
1¼ inch	40 00	.....
1½ inch	43 00	36 00
1¾ inch	43 00	36 00
2 inch	50 00	36 00
2¼ inch	53 00	38 50
2½ inch	55 00	42 00
3 inch	64 00	50 00
3¼ inch	.....	58 00
3½ inch	77 00	60 00
4 inch	90 00	75 00

Wrought Pipe Revised; Lapweld Goes Higher

WROUGHT PIPE.—New prices named show no change in the standard buttweld pipe, advances being confined to the standard lapweld. As noted in last issue of SANITARY ENGINEER, on this latter, sizes up to 4 inch are up 5 points and 4½ inch and larger 10 points. Steel pipe is becoming increasingly hard to get and greater dependence will have to be placed in genuine wrought iron. Sizes smaller than 2 inch in all grades are in fair supply, the greatest scarcity developing in 2½ inch and larger. In the XX strong buttweld pipe, manufacturers have withdrawn quotations on sizes larger than 2 inch. Prices are now shown on standard buttweld and standard lapweld in both steel and genuine wrought iron as follows:

WROUGHT IRON.
Price List No. 37—September 11, 1918

Standard Buttweld

	Steel		Gen. Wrot. Iron	
	Per 100 feet			
	Blk.	Gal.	Blk.	Gal.
⅛ in.	$ 6 00	$ 8 00	$.....	$.....
¼ in.	5 22	7 35	5 52	7 65
⅜ in.	5 22	7 35	5 52	7 65
½ in.	6 63	8 20	7 06	8 71
¾ in.	8 40	10 52	8 97	11 09
1 in.	12 41	15 56	13 26	16 41
1¼ in.	16 79	21 05	17 94	22 20
1½ in.	20 08	25 16	21 45	26 54
2 in.	27 01	33 86	28 86	35 71
2½ in.	43 29	54 11	.....	.....
3 in.	56 51	70 76	.....	.....
3½ in.	71 76	88 78	.....	.....
4 in.	85 02	105 19	.....	.....

Standard Lapweld

	Steel		Gen. Wrot. Iron	
	Blk.	Gal.	Blk.	Gal.
2 in.	$ 31 82	$38 30	$33 70	$40 20
2 ½in.	47 97	58 21	50 90	61 10
3 in.	62 73	76 12	66 66	79 90
3½ in.	78 20	96 14	82 80	100 00
4 in.	92 65	114 00	98 10	119 00
4½ in.	112 00	137 00	125 00	149 00
5 in.	130 00	159 00	145 00	174 00
6 in.	169 00	206 00	188 00	226 00
7 in.	219 00	268 00	243 00	292 00
8L in.	230 00	281 00	255 00	306 00
8 in.	265 00	324 00	294 00	353 00
9 in.	317 00	388 00	.....	.....
10 L in.	294 00	360 00	326 00	392 00
10 in.	379 00	464 00	420 00	505 00

Terms 2% 30 days, approved credit.
Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Easier Feeling As Regards Supplies

SHEETS, PLATES.—There are signs of a little improvement in some marketing conditions. The plate situation, which has been almost hopeless, shows signs of betterment. And the Canadian allotment of material from United States points has been increased by about 50 per cent., enough to make the difference noticeable. The shipyards look to the government for their supplies now. Mills at the big producing points in United States have been concentrating on plates for some months, and the result is that there are indications of the demand being overhauled.

Local dealers have received schedules showing just what the various ratings given by the Washington authorities mean. This is done so that jobbers and others can study the list and find out for themselves just where they stand in the line. It is now a fact that Ottawa shows a tendency to weed out orders more strictly than was the case a few months ago.

The situation seems easier in so far as the securing of material is concerned, but there is no possibility of the supply getting neck and neck with the demand and creating a surplus. There have been no price changes.

BLACK SHEETS—	Per 100 lbs.		
10 gauge	$.....	$10 00	$.....
12 gauge	.....	9 60	.....
14 gauge	7 95	8 40	8 90
16 gauge	8 00	8 50	8 55
18-20 gauge	8 05	8 30	8 80
22-24 gauge	8 10	8 35	8 85
26 gauge	8 15	8 40	8 90
28 gauge	8 25	8 50	9 00
3-16 inch plate	.....	10 00	.....
¼ inch boiler plate	.....	10 00	.....

Prices shown are for full cases. An extra charge of from 25c to $1 per 100 lbs. is made for less than case lots.

GALVANIZED SHEETS—	
10¾ oz.	$11 00
U.S. 28	10 70
U.S. 26	10 40
22 and 24	10 25
18 and 20	10 10
16	9 95
14	9 85

Prices shown are for full cases. An extra charge of from 25c to $1 per 100 lbs. is made for less than case lots.

Solder Down 1c; Lead Products

LEAD AND ZINC PRODUCTS.—Solder is down 1c per pound all around in some quarters. Tin is slightly lower, which is the contributing factor in this change. Prices now show the following range: Guaranteed, 57c to 59c per pound; strictly, 53c to 57c; commercial, 46c to 50c; wiping, 45c to 54c; wire, 55c to 70c.

Manufactured lead products are unchanged. The demand is comparatively light and stocks are fair. Pig lead is none too plentiful and a strong undertone to the market is noticeable. Range of quotations follows:

Lead pipe, lb.	....	0 15
Lead waste pipe, lb.	....	0 16
Lead traps and bends	....	Net list
Lead wool, lb.	0 15½	0 16
Lead sheets, 3 to 3½ lbs. sq. ft., lb.	....	0 13¼
Lead sheets, 4 to 8 lbs. sq. ft.	0 12½	0 13
Solder, guaranteed, lb.	0 57	0 59
Solder, strictly, lb.	0 53	0 57
Solder, commercial, lb.	0 46	0 50
Solder, wiping, lb.	0 45	0 54
Solder, wire, lb.	0 55	0 70
Zinc sheets, per lb.	....	0 26

Cut sheets, ¾c. lb. extra and cut sheets to size, 1c. lb. extra.

Scrap Materials Quiet; Prices Steady

OLD MATERIALS.—The scrap metal situation is almost at a standstill. Consumers state they are having trouble in securing enough good scrap to make up for the shortage in pig iron. The dealers on the other hand claim that the steel mills and the foundries are full to the roofs of all the scrap they need. There is very little business moving at present through the scrap dealers' yards, but on the other hand there are a large number of sales being made direct from the producers to the melters. Prices are unchanged.

Dealers' Buying Prices		
Tea lead	$0 05¼	$....
Heavy lead pipe	....	0 08
Yellow brass	0 12	0 13
Red brass	....	0 21
Light brass	....	0 09½
Heavy zinc	0 05½	0 06
Heavy copper	0 22	0 23
Stove plate, per ton	....	25 00
Old cast iron, per ton	....	30 00

Tin a Little Easier; Lead Firm

INGOT METALS.—Tin is easier and the trade generally awaits details of government control. Previous information was to the effect that two-thirds of world's supply was to come to United States and be distributed at regulated prices, now it appears that the British government has taken control and is operating through one importing firm as its agent. This action would probably work out to best advantage as available supplies could be determined more readily and allocations made according to importance of various industries. It would probably mean lower prices to the consumer as well. Lead is firmly held and spelter quiet.

COPPER.—Heavy demands continue to tax capacity of refineries but most essential needs are being taken care of. Locally the situation is without feature, prices holding firm at 30c to 32c per pound.

TIN.—The market is easier locally at $1 to $1.05 per pound, and some transactions at around 95c are reported. Supplies are fair with essential industries securing sufficient to keep operating.

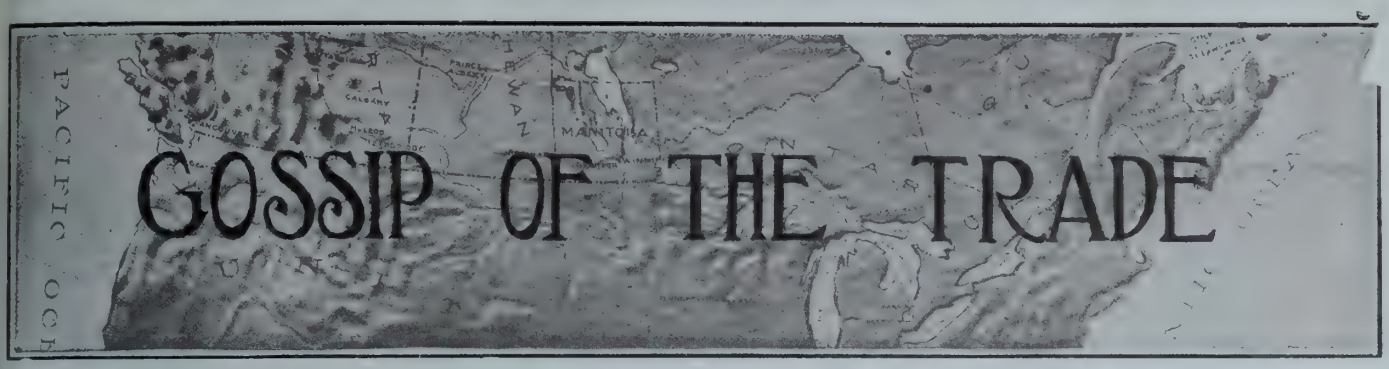
SPELTER.—No change in prices has been made, the market being steadily held. The demand is comparatively light just at present with supplies ample. Price remains at 11c per pound.

LEAD.—Labor scarcity is affecting output of this metal and there is little obtainable. Prices are very firm, producers holding at level recently agreed upon. Locally quotations are being made at around 10½c to 11c per pound.

ALUMINUM.—There is no news or excitement in this market. Supplies are being absorbed in government work and quotations nominally hold at 50c per pound.

ANTIMONY.—A fair demand exists

Continued on page 38



GOSSIP OF THE TRADE

PLUMBERS WANT REPRESENTATION

AT the regular monthly meeting of the Master Plumbers of Montreal on September 12th an important resolution was presented and discussed. This had to do do with the securing of recognition through representation on the various boards of directors within the bounds of several school districts, as affecting the Council of Arts and Manufactures within the City of Montreal.

The contention was made that, as the Master Plumbers were really instrumental, in the first instance, in starting or inaugurating these councils by offering prizes, etc., they were rightly entitled to proper representation at this time. For at present they have no direct voice in matters relating to the training of apprentices passing through the schools. And to support the argument of the Master Plumbers in this particular, records clearly indicate that they were instrumental in having the Council of Arts and Manufactures furthered and established through the interest above outlined.

It was unanimously agreed that the matter should be brought to the attention of the Provincial Secretary and that his consent for representation on the Council of Arts should be granted.

Also Act Re Wage Scale

A second matter of much importance was introduced and discussed at length. It was shaped in the form of a resolution and which read as follows:

"Whereas the Department of Labor of the Dominion had attached to various specifications a schedule of wages to be paid workers in the various trades, and whereas sub-contracts had been let on various jobs through which prices paid to various mechanics were lower than the scheduled wages above-mentioned, therefore the secretary is requested to write the Department of Labor for particulars of this matter."

These matters received free and full discussion and the replies to the communications affecting these matters will be of interest when received, it is expected.

Election of officers to fill the vacancies on the Executive Committee of the Canadian Society of Domestic Sanitary and Heating Engineers resulted in the following choices being made: For Secretary-Treasurer, John Watson, who thus succeeds L. J. Conroy; Quebec Province Vice-President, W. R. J. Hughes, succeeding Jos. Laurier; Chairman Apprenticeship Committee, Peter C. Ogilvie, succeeding John Watson and J. Lavigneur, Chairman Heating and Ventilating Committee succeeding R. J. McCauley.

A POSSIBLE SUBSCRIBER TO SANI-SANITARY ENGINEER

All smiles appeared on the face of W. G. Crawford of 6 Bingham Ave., Toronto, when he shyly informed SANITARY ENGINEER that Mr. Stork had dropped at above address and left a big bouncing son at 7 a.m., Sept. 24, and all well, and if that son takes after his dad he's sure some bouncer, and will not be long ere he reads SANITARY ENGINEER; in fact, friend Crawford felt like taking out another subscription for the new arrival, but we had our doubts about the little fellow being able to read it for a while, though we certainly like to get all the subscribers we can; we also very much like to have every subscriber read their trade paper. But we're hoping, anyhow, that when Sonny Crawford does grow up we'll get his subscription to SANITARY ENGINEER; we know we will if he takes after his Dad.

SAVE COAL BY MAKING BUILDING LESS DIFFICULT TO HEAT

The city commissioners of Montreal have authorized the expenditure of $19,-805 in order to change the heating system at the City Hall and save about $5,-900 per annum in fuel. The proposal is to utilize the steam boilers in the annex for the heating of the two buildings, connecting them with a steam conduit. The plan has been worked out by the Director of Public Works, and the expenditure is being made in order to meet the wishes of the fuel controller, who has asked the commissioners to economize in the coal consumed at the City Hall. All the window frames of the City Hall are being taken out and reseated in order to make the offices less draughty and thus save heat.

NEW BOOKLETS

The Port Hope Sanitary Manufacturing Co. have issued two very nicely gotten up booklets, one describing a number of bathroom layouts with approximate cost. It is for distribution to the home builder and contains some very interesting information.

The other booklet is entitled "Port Hope cast iron traps" and contains a full description of a new line of cast iron traps, black and cast iron enamelware, of a number of styles.

These booklets can be procured by dropping a postal to the head office, Royal Bank Building, Toronto.

CONTRACTS AWARDED

The Masonic Temple, Winnipeg, plumbing and heating contract to Bowyer Boag, Ltd.

Bowyer-Boag, Ltd., the plumbing and heating contract for a new school in Winnipeg.

Chas. D. Kirk Co., 402 Tribune building, Winnipeg, the plumbing and heating contract for the St. James school, Winnipeg.

W. J. McGuire & Co., Montreal, the plumbing and heating contract in connection with the new addition to technical school.

Thomas Johnson Co., Moncton N.B., the plumbing and heating for the Humphrey's Glass Works now under construction.

The plumbing work for the alteration and additions being made to the Royal Bank Building, George St., Halifax, N.S., to Farquhar Bros.

The Furness, Withy Co., Halifax, N.S., are erecting a $25,000 warehouse and have awarded the plumbing and heating contract to Farquhar Bros. of that city.

The Standard Plumbing & Heating Co., Fort st., Winnipeg, the plumbing and heating contract for the new school to be erected at St. Rose Du Lac, Manitoba.

The Provincial Government, Quebec, have awarded A. English, 191 Hargrave st., Montreal, the plumbing and heating contract in connection with the new $200,000 sanitorium.

The Regina Plumbing and Heating Co., Regina, plumbing and heating in connection with the new Roman Catholic church to be erected in Gravelbourg, Saskatchewan.

The plumbing and heating contract for the new $16,000 bank building being erected at Vermilion, Alta., by the Canadian Bank of Commerce, to the Bowyer-Boag Co., Winnipeg, Man. The same concern have also been given the plumbing and heating contract for a new bank

building to be built in Virden, Manitoba, by the Canadian Bank of Commerce.

A. Beliveau, Three Rivers, the plumbing contract for the $5,000 frame bungalow being erected by Alphonse Marchand, Cap de la Madeleine, Que.

A. Carruthers Co., King street, Winnipeg, are erecting a $15,000 warehouse and have awarded the plumbing and heating for same to Bowyer-Boag Co. of the same city.

By the Royal Bank of Canada, Winnipeg, the plumbing and heating work for a new bank building to the Townsend Plumbing and Heating Co., Portage ave.

A. English, Hargrave st., Winnipeg, the plumbing and heating contract for the Province Theatre now under re-construction.

Josie & McLeod, 353 Notre Dame ave., Winnipeg, the plumbing and heating contract for the R. Bell Engine & Thresher Co.

Jno. McGraw, Brantford, is erecting a $3,800 residence and has awarded the heating contract to Turnbull & Cutliffe Co., 50 Colborne st.

J. Kerr, Hamilton, the plumbing contract, and C. Havers, the heating contract for a $3,000 residence being built by A. B. McKay, 66 King st. East, Hamilton.

By V. Stevens, 164 Park st., Moncton, N.B. the plumbing and electrical work for double residences to Perry Bros., Main st.

W. G. Charleston, 509 Rideau st., Ottawa, is erecting a $5,000 residence and has awarded the plumbing contract to Coldrey & Chapman, 348 Rideau st.

By M. E. & A. M. Davis, 24 Clemow ave., Ottawa, the plumbing contract for a $5,000 residence to J. R. McLennan, 240 Bank st

By Schultz Bros. Co., Brantford, the plumbing contract for three $2,000 houses to Chas. Taylor & Co. and the heating contract to W. H. Turnbull & Sons, 99 Colborne st.

G. Moss, 14 Fairleigh ave. South, Hamilton, Ontario, is erecting a $3,500 residence and has awarded the plumbing contract to J. Kerr, Sherman ave. and the heating contract to H. Day, 34 Huron st.

THROUGH THRIFT TO VICTORY

The foundations for a policy of industrial reconstruction following the war must be laid in thrift. The country must provide largely the funds out of which both the basis and superstructure of our new economic life are to be extended and reared. From the savings of the men and women of Canada only can these funds be drawn. The employer may greatly assist in the encouragement of thrift by advocating it among his employees, from whom it will extend in an everwidening circle to the general community. Saving must precede reconstruction if that work is to be of an adequate character; and it should begin now in this heyday of prosperity. The country may soon call for further financial help in finishing the war. The saver will be ready.

Shawinigan Falls, Que.

A $5,000 two-storey frame residence for P. Deschenes: Plumbing, Frederic Demers, Montreal, or care of owner.

A $7,000 two-storey frame residence for Achille Houle; plumbing, Richard & Bergeron, Shawinigan Falls.

In connection with the erection of tenements costing $10,000 for Oscar Vaillancourt; plumbing, T. Richard.

A $5,000 three-storey bungalow for Jos. Tremblay: plumbing, N. Fortin.

A $5,000 two-storey brick residence for Arthur Vincent: plumbing, N. Godin, Ste. Flore.

Toronto Residences

Three pair of two-storey brick residences costing $15,000 are being erected for F. T. Burgess, 36 Langley ave.: Plumbing and heating, J. T. Bowes, 45 Harcourt ave.

Altering one pair of residences for two duplex costing $3,600 for Taylor & Nesbit, 18 Havelock st.: Plumbing and heating, McNaughton & McKenzie, 1029 Shaw st.

WINNIPEG PLUMBING DIVISION

Permits Issued

74

Inspections

Water Tests	Smoke Tests	Subsequent Inspections	Miscellaneous Inspections	Defects Rectified
56	80	315	20	215

Sewer Division

Permits issued	Connections constructed	Inspections
25	17	55

Sewer Maintenance Division

Tank Flushings Gallons	Hose Flushings Gallons	Total Gallons of Water
557,568	578,750	1,136,318

The above table shows the work accomplished by the Winnipeg Plumbing and Sewer Inspection Department during the month of August—a public service that cannot but be of inestimable value to the citizens of Winnipeg.

"UNCLE SAM" IS NOT A BLUFFER

(Continued from page 30)

standing of the ideals animating both the American and British people, ideals that will carry them along the same road in the same direction in whole-souled co-operation for the progress of humanity and the peace of the world."

The Spirit of America

My message is prompted by the most sincere thought and best wishes, because I want Canadians especially to know what the spirit of America is. I want to get into their very souls the passion and love for the sons of Uncle Sam that the sons of Uncle Sam have for them. I want them to understand that their heart is as great as the nation over which their emblem of liberty flies, and what is more, it beats true and in sympathy with all that can be termed human fellowship. It is consecrated to the highest ideals of humanity in its noblest form. The spirit of America is liberty, but it does not invade the rights of others, for it well knows that to enjoy liberty, it must extend it to others. It pleads for the rights of men to think, to reason, to investigate to the end, that the future may be enriched with the thoughts of honest men. It implores every human being to be a soldier in the army of progress, and it extends to him every right it claims for itself, believing that when all men give to all others all the rights they claim for themselves, the world will be civilized. Uncle Sam has had his difficulties, but they have stimulated, rather than stifled, his energy and the spirit of America, born of liberty, justice and truth, has surmounted a greater variety and combination of obstacles than I believe ever fell to the share of any one people in the same space of time, and to-day it is returning to the world the fruits of the belief that the universe was planned for good and the blessings of Creation were intended for the admiration and benefit of all mankind.

TAKE YOUR CHOICE

"After Germany has won," said Bethmann-Hollweg, the German Chancellor last year, "United States will find herself confronted with an indemnity claim which will about equal the entire amount expended by Germany in the whole war. For every loan to the Allies, for every bullet, every shell, every gun, every conceivable item of war material shipped by America to the Allies, there will be an accounting in gold."

There you have the proposition from the mouth of a German authority, direct. Would you rather help to your uttermost so as to insure our freedom; or have a German taskmaster stand over you and ring the dollars out of you in the years to come?

If Germany plans to be so bad with the U. S., what in heaven's name has she in store for Canada? It's up to us to save and serve wherever possible.

MONTREAL NOTES

Canadian Society Domestic Sanitary and Heating Engineers Out For 1919 Convention

MONTREAL will have a bumper Plumber's and Heating Engineer's Convention in the early summer of 1919. That is, if the efforts now being put forth by President Alex. Charette and other officers of the above society bear the fruit it is confidently hoped they will. Not having had a convention for some little time, it is the opinion of SANITARY ENGINEER that President Charette has taken the matter up in good season and that this move is none too early for the important considerations that will have to be discussed and the details that will have to be fully worked out in the coming fall and winter months.

The initiatory steps already taken include that of a letter sent out to the members of the Canadian Society of Domestic Sanitary and Heating Engineers in August and which reads as follows:

Montreal, August 5th, 1918.

To the Members of the Executive Committee of the C. S. of D. S. & H. Eng.:

Dear Sir,—At the request of the President I am writing the several members of the Executive Committee and request an early reply to this communication.

It is our president's intention to start now and organize for a bumper convention to be held in June, 1919. President Charette is very anxious to have the co-operation of the whole membership as well as of all the members of the Executive Committee.

Through sickness and other causes we have lost several members of this executive committee since the last convention, and therefore wish, if there are any changes to be made in your district, to have your local or provincial secretary recommend to our sub-committee the name of some member to fill the office correspondingly with the name of the committee as printed on this letter-head. Of course, you will understand that we do not wish for any change providing you are willing to fill your present office.

Mr. Conroy, the secretary elected at the last convention, resigned, and I have been appointed secretary protem. We would therefore ask that you and the whole membership give your valuable assistance.

We believe there is a great deal of work that can be done by this Canadian Association, but your officers must have the loyal assistance of the members to gain the desired effect. We therefore ask for comments or any suggestions from officers and members of this Society. We ask that you forward your list of members in good standing in your association; also their addresses.

The capitation tax is now due, and the amount is two dollars per member, this amount covering two years' fees, 1918 and 1919. We want our organization to be in first class order for work after this terrible war is over. We know that a great number of our members have been sadly affected and this is a serious time for most of us, but we must not only win this war and keep the old flag flying, but must make provision for the wonderful business which must come thereafter.

We desire that you give this communication your immediate attention and hope for an early reply.

Yours truly,

Sgd.—Alex. Charette, President,
John Watson, Sec.-Protem,

4145 St. Catherine St. West, Montreal, Quebec.

The matter of holding a convention in 1919 is therefore fairly well launched already and SANITARY ENGINEER is of the opinion that wisdom has directed the President and Secretary in impressing the necessity of again meeting in convention to discuss the big problems that must sooner or later receive attention.



Jno. W. Bruce, Toronto

It is very necessary that the interest of the trade be maintained in just such trying times as the trade has experienced in the past four years. Indeed it is not amiss to say that conditions have called for a closer understanding and greater co-operative effort than in normal times and under regular trade conditions. A little retrospective thought will reveal the fact that few organizations have cancelled their regular conventions—they have been the more careful to perpetuate them and intensify the interest of their various members.

Here's hoping that 1919 will see the biggest, the best and the most fruitful convention any previous records can boast.

NOW ON DOMINION LABOR APPEAL BOARD

It is being proven every day that there are at least a few men of ability in the plumbing trade. The journeymen are not without their big men, by any means, one of their number having recently been appointed to act on the Dominion Labor Appeal Board. We refer to Jno. W. Bruce of Toronto.

Mr. Bruce learned the plumbing trade as a journeyman in Australia. Procuring, as it were, an international experience, travelling through India, South Africa and other countries, he finally arrived in Canada in the year 1906.

Always interested in the labor movement, he lost no time in becoming acquainted with his fellowcraftsmen in this country by joining as an ordinary member of Local 46, Toronto.

In the year 1908 "Jack," as he is known to the boys, had so won their confidence that he was elected delegate to the Trades and Labor Congress held in Indianapolis. In 1910 he was again their chosen delegates to Congress, held that year in St. Paul, and at that event was appointed Canadian organizer for the U. A. Plumbers, Steam and Gas Fitters' Union.

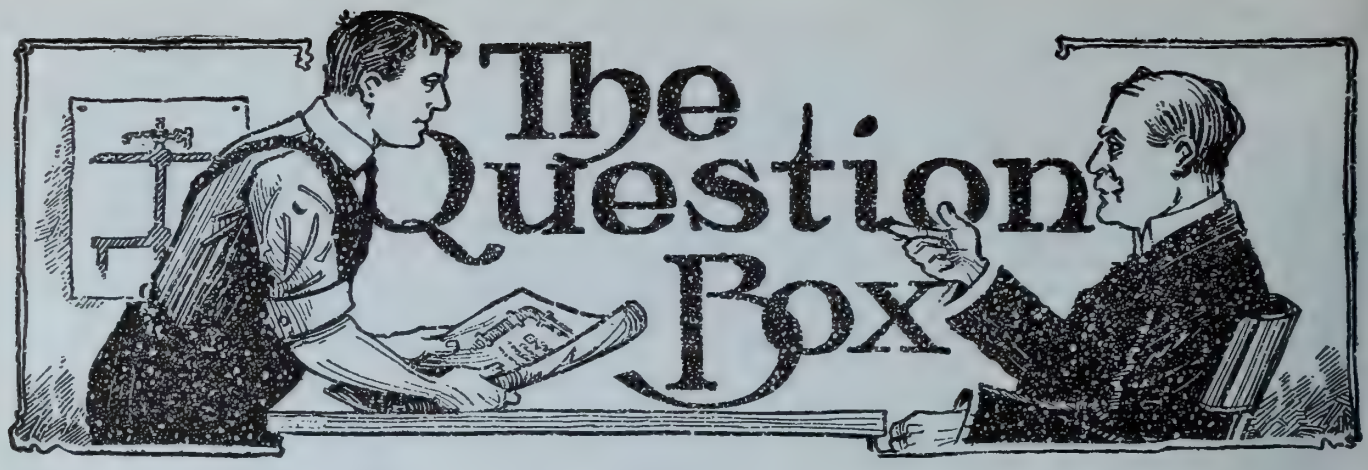
In 1913 the Trades and Labor convention was held in Boston and Jno. W. Bruce was again elected to represent that body. Then again he attended the 1917 convention held in Toledo as official representative of the above union.

When the Dominion Government requested that labor should have a representative on the Federal Board of Appeal, Mr. Bruce was elected to act on that board in the interest of labor.

So it will be seen that in Canadian labor circles Jno. W. Bruce has, without doubt, those qualities in his make-up which appeal to organized labor in Canada.

There are times when the ship of labor and its crew have to ride some boisterous seas, but somehow or other with Jack at the helm she makes port sturdy and trim. Only recently the plumbing craft and journeymen and employers in Toronto were not on as amiable terms as they are to-day, but by hard work and fair dealings between interested parties there now exists a greater confidence between these two bodies. Jack had, of course, to pick his men. He appeals to them in a very diplomatic way, and the men whom he represented showed a desire to be fair.

We hope that under the guidance of such men as Mr. Bruce the journeymen will be led to see that each and all Canadians are co-partners in Canada. That every man will realize that all men have just rights and responsibilities to bear. By choosing men of the calibre of Jack, men who have worked themselves up as he has done, from the ranks, and have gained their confidence as he has done, we may all look forward to those times when the clang of battle is silent and peace reigns throughout the whole world.



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published--Description of Jobs Done or Shop Kinks Are Also Invited.

TROUBLE WITH HARD WATER

Editor SANITARY ENGINEER:

I have a customer who runs a bakery and he requires a large quantity of hot water. Some time ago I installed him a pipe coil in his bake oven, connected same to a 30-gallon range boiler in the usual way. The water is very hard and we find that the coil gets choked up with lime very often and requires cleaning out. It just occurred to me that there may be some simple way out of the trouble. I asked you about using a water softener some time ago when you were on a visit to our town, but I do not want to use a water softener on this job. Any information on this subject will be greatly appreciated.

C. C. H. B., Ontario.

There are several ways by which this trouble can be overcome. One would be to procure a good supply of soft water, say rain water, and see that it is filtered; then connect the coil now into a small steam boiler placed above the top pipe of the coil. Fit up the steam boiler with water column and gauge glass as well as pressure gauge. Then procure a range boiler with copper coil as shown in Fig. 3. The range boiler should be supplied with hard water as at present, but the steam boiler furnished with soft water. The steam returned from coil would not require very much water for making steam.

A less expensive way would be to adopt methods shown in Figs. 1 and 2. Fig. 1 shows a soft water tank or cistern at a higher level than the oven or range boiler, the higher the better. This water must be clean and if connected as shown with coil in the bake oven as well as in the range boiler, it will be found to give every satisfaction. There is one thing to bear in mind and that is that the size of coils depend upon the quantity of hot water required as well as the height of the water in the cistern above. If a greater temperature is required, a booster can be fited to the piping leading from cistern to the coils; this will increase the boiling point of the soft water to approximately 230 to 240 de-

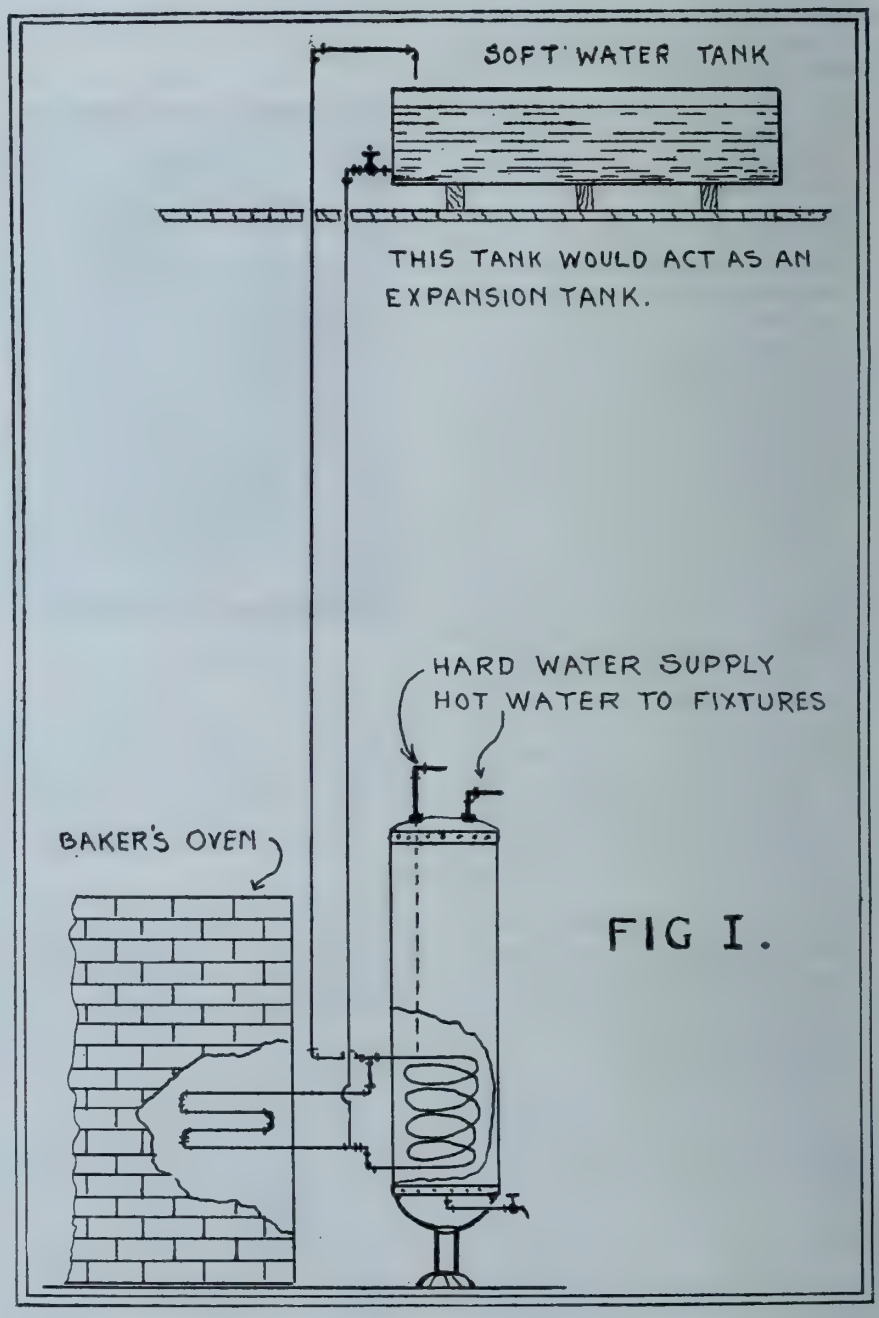
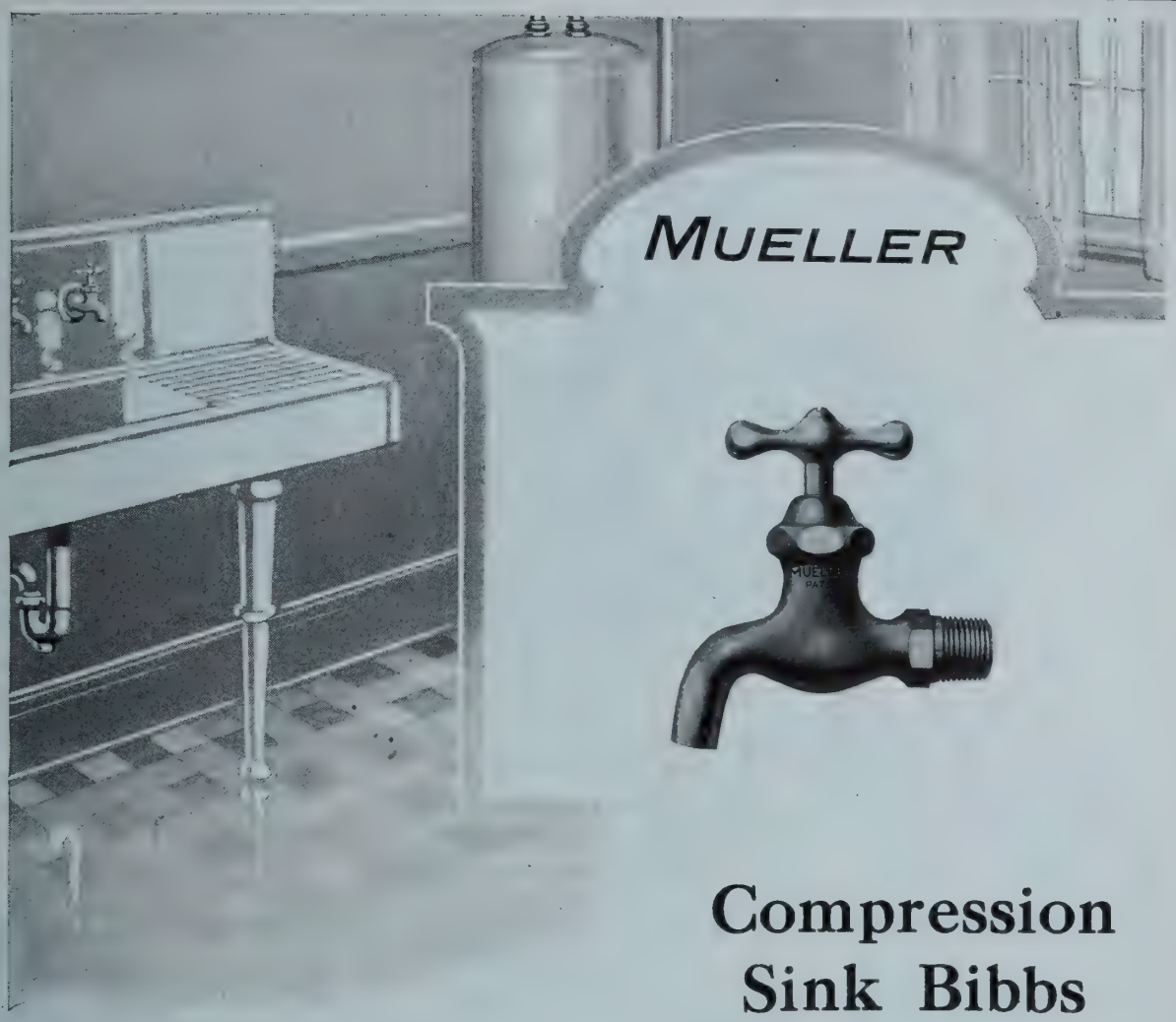


FIG I.



Compression Sink Bibbs

SIMPLE elegance, combined with superior strength and wearing quality, is what you give your customer when you install **MUELLER** goods.

The many advantageous features of **MUELLER** compression bibbs give maximum service from the bibb as a whole. The anti-spreading device that breaks up the whirling motion of the water and the corrugated stem and handle, allowing the handle to be set at any angle without becoming loose or wobbly, are only two of these features.

MUELLER Bibbs are the best the market affords. Write for prices.

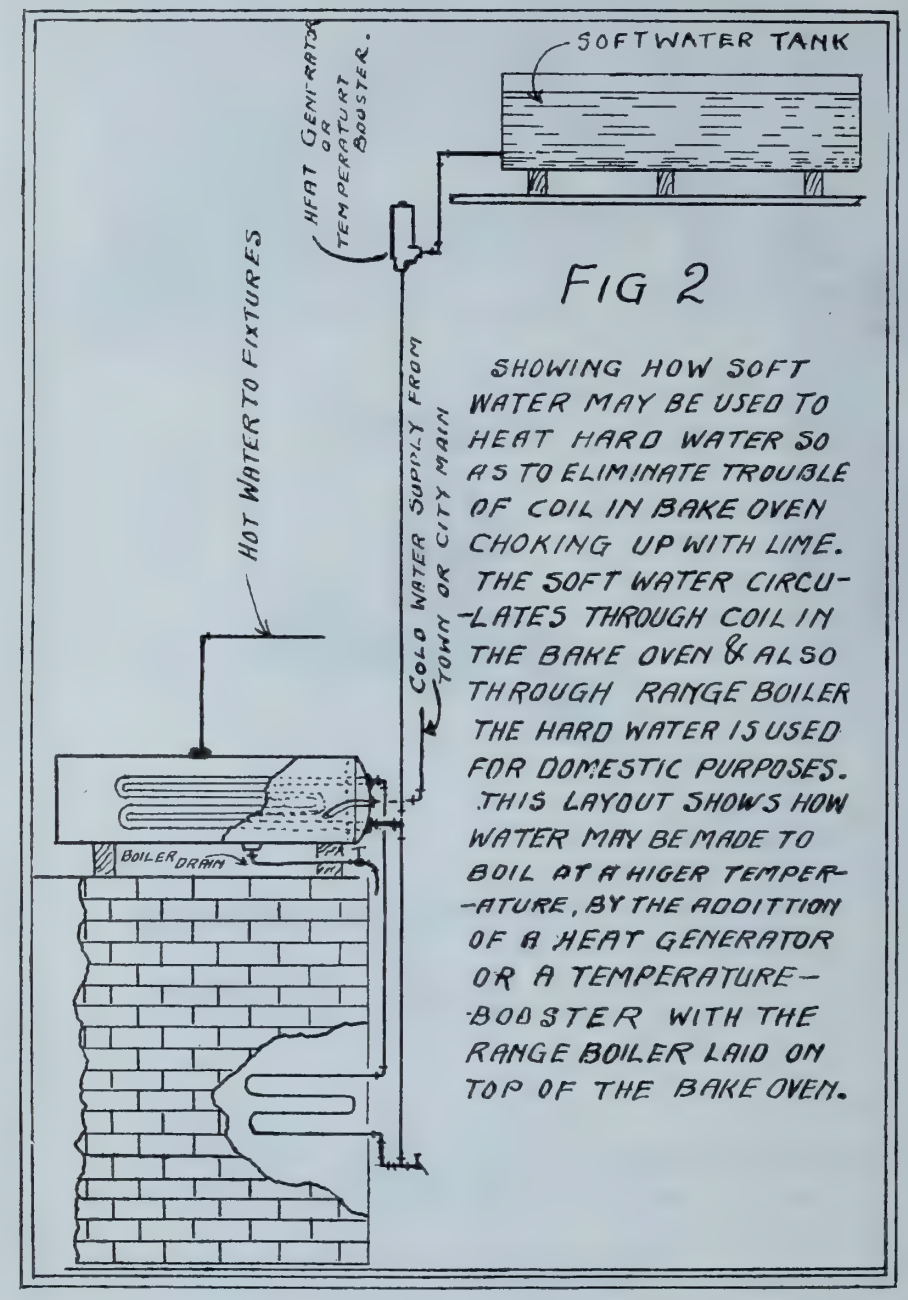
H. Mueller Mfg. Co., Limited

SARNIA CANADA

MUELLER

grees Fah. as against 212 degrees atmospheric pressure. All the piping should not be less than 1 inch except the expansion pipe shown in Fig. 1 leading to the top and over into the cistern.

EDITOR.



BRANTFORD PLUMBING BY-LAW

Continued from page 20

ducts we are under the impression that while not less than 28 square inches area cross section is allowed, the size of this duct should be based upon the size of the compartment to be ventilated.

Lighting

32. Light shall be furnished by a window of at least three square feet area opening to the outer air, or from another room by means of a tight window of at least three square feet or by means of sufficient artificial lights.

It may appear a hardship in many cases to demand natural light, but we certainly cannot see how a clause such as 32 can be of much use, because there are so many alternatives.

Under this clause a person could take a portion off from even a bedroom, to be extreme, for a W. C. compartment and place a light window at 90 degrees with the bedroom window so as to furnish light, and such a compartment would be within the meaning of clause 32, or even exclude natural light altogether and furnish electric light or even gas light. We are, as we stated before, merely pointing out what could be done under this clause by a person not having the true spirit of modern sanitation in their make-up.

(Continued in next issue)

MAKING SERVICE CONNECTIONS TO CONCRETE WATER MAINS

Development of concrete pressure pipe for water conduits has progressed to the point where such pipe can be used for city distributing mains for hydraulic pressures not exceeding 80 pounds per square inch. Service connections to such mains are made in a very simple manner as illustrated by the accompanying drawing. Regular stock pipe fittings are used. No tapping machine is required and for that reason excavation need be carried only to the top of the pipes instead of below their bottom, as would be necessary in making connections to other types of conduits. Considerable labor is thus saved.

This service connection broadens the field of usefulness of reinforced concrete pressure pipe and will make it possible for municipalities to install water systems at lower cost than would be possible with the usual types of water conduit.

MARKET CONDITIONS AND TENDENCIES

Continued from page 32

and the undertone to the market is steady, with price unchanged at 18c per pound.

PIG IRON.—Approval of recommendations of the War Industries Board on pig iron has been secured. The base price at U. S. points on basic iron is increased to $33 f.o.b. furnace. The base price on No. 2 foundry iron is increased to $34 f.o.b furnace. The base price of standard Bessemer iron is fixed at $35.20 f.o.b. furnace, subject to changes from previous practices as regards delivery.



It's Only a Handful

SINCE it's only a handful why leave it behind?

Before you return you may need to turn a thread, make a bend, cut off an end or perform any of the other ordinary operations for which a steamfitter is usually summoned.

Better go prepared and clinch a lifelong customer on your first visit.

Williams' "Vulcan" Chain Pipe Vise

Three sizes: for ⅛ to 8 inch pipe.

J. H. WILLIAMS & CO.

"The Wrench People"

77 Richards Street, Brooklyn, N.Y.

The A. G. Low Co., Ltd., 77 Pacific Ave., Saskatoon, Sask.

Agents for Manitoba, Saskatchewan, Alberta and British Columbia.



There's Money In IT for YOU!

Heating Engineers will welcome this, the latest and greatest invention in connection with their profession.

"A 'perfect' heating system."

That is the only description that can be given to the "Dodd Heating System"—eliminating, as it does, all the faults and shortcomings of the coal-fired boiler.

THE DODD GAS HEATER

Fired by gas (the cleanest of fuels); automatically controlled and regulated by a Thermostat. Constructed on scientific principles—fool-proof—and above all economical in operation, the "Dodd" is the ideal heater—it may be used wherever a hot-water, steam or vapor system is installed.

The owner of a Dodd Gas Heater has no furnace trouble—no cellar work.

To obtain heat, it is only necessary to light the pilot-light—set the Thermostat to the degree of heat desired—and leave the Dodd to do its work. It will "carry on" night and day—week in, week out—throughout the Fall, Winter and Spring, burning only sufficient gas to give the necessary heat. We have faith in our product—a mighty faith. We have tested the Dodd Heater under all conditions—and can show you recording charts, fuel-consumption accounts, consulting heating engineers' certificates. Moreover, we are prepared to give a strong guarantee with every Dodd Gas Heater.

Your clients want to know about this perfect heating system—we want you to tell them all about it. In order to do this, you must investigate our claims—and understand our system. Spend a little of your time in making an investigation.

We will advertise this Heater extensively. You will be questioned by your clients—have your information ready. Be posted. Know the fine points of our system, so that you can talk it intelligently.

Co-operate with us in introducing to the public the ideal heating system—one that will bring you added prestige and substantial profit.

We will help you in every way possible—let us explain our sales plan.

THE DODD HEATING SYSTEMS LIMITED

34 VICTORIA STREET - - - TORONTO, ONTARIO

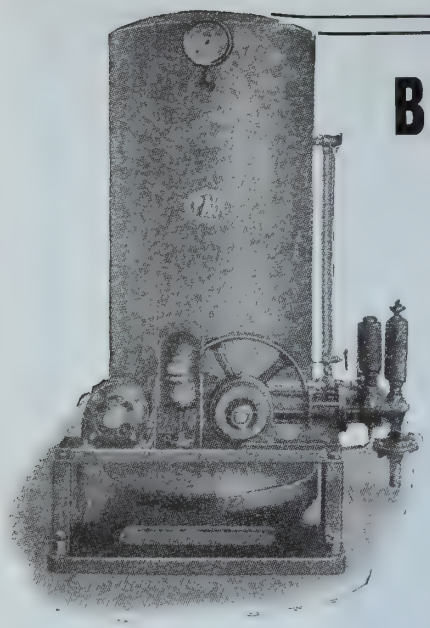


Fig. 886
Complete Unit Water System Type F.
Electric Motor Pump

BE A BIGGER BUSINESS BUILDER

There's a better and bigger business for the sanitary engineer who hitches his plumbing job to a **"Paul."**

We challenge all comers for efficiency of service and durability. No trouble when once installed is the verdict of every one of our customers. That's more than can be said of most pneumatic water systems.

Remember This---

"Paul" Pumps and "Hurley" Service pull repeat orders. They sell themselves.

HURLEY MACHINE COMPANY, LIMITED

413 Yonge Street
Toronto, Canada

498 Portage Avenue
Winnipeg, Man.

M. & T. COILS

EXTENDED SURFACE



Our Coils are not simply cored castings, but are specially designed to heat water with less effort and using less fuel. The extended surfaces and special tappings make the M & T Coils **the most efficient** on the market.

McINTYRE & TAYLOR
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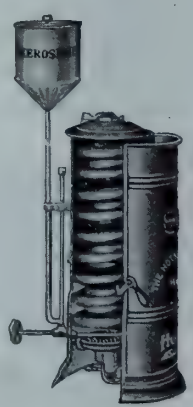
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The Hotstream Heater
WATER HEATER

Kerosene Water Heater



Here is a REAL kerosene heater. Heaters as FAST and HOT as gas. Patented wickless burner generates its own gas and throws a clean, powerful, odorless, blue flame.

Will run over 12 hours on a gallon.

Burner absolutely **noiseless.** Send for descriptive folder.

Also Made With Cast Sections

The Hotstream Heater Co.

"Makers of heaters that heat"
CLEVELAND, OHIO

W. H. CUNNINGHAM & CO., 183 Church Street, TORONTO
Canadian Representatives

After the War——What?

The time to put on fire insurance is before the fire. The time to prepare for after-the-war conditions is before peace comes.

Advertise now and be prepared to keep your goods in demand through the medium of SANITARY ENGINEER

Success and Your Associates

ALWAYS associate with men who are earning more money than you are. Such is the advice given by a man whose name is known the world over for his own success and the business which he created. It is good advice of a certainty, but we are not urging that it is the best advice. At the same time it is wise to associate with better or bigger men than you are yourself, because you are likely to be lifted up to their levels.

Most of us would probably like to be the intimates of J. P. Morgan, or of John D, or of Charlie Schwab, or Canny Andrew. If we had a speaking acquaintance with John Wanamaker, or Lord Beaverbrook, or Lord Shaughnessy, and with other distinguished and successful men, we would take comfort from the fact.

And most of us would feel rather small and uncomfortable if we were placed beside President Woodrow Wilson at a dinner table, or beside Sir Robert Borden, Sir Herbert Holt or Sir Wm. Mackenzie. And the reason would probably be that we know so little of the knowledge that really counts. If these successful business men engaged us in conversation we would probably find ourselves knowing very little about the things that matter.

This will illustrate the point:

Here's a true story. A Toronto manufacturer found himself on a train going to Albany in company with a number of distinguished Americans about to attend the inaugural ceremonies of a State Governor. A washout led to a delay, and the Canadian was thrown into close association with senators and congressmen and prominent lawyers. They bantered the little Canadian about Canada. He had the pluck of a bigger man. He had been a constant reader of THE FINANCIAL POST, and had absorbed many facts about Canada. He surprised his American traveling companions with his positive, well-informed and wide knowledge of Canada. When the company reached Albany, the Canadian was persuaded to attend the ceremonies, and was introduced as the man who knew all about Canada. The Governor was interested in Canada, and said so, and the little Canadian found himself telling the story of Canada very ardently to a very attentive listener, much to the amusement of his friends who introduced him.

This man made a hit on that journey, and many friends. One of the company gave him a stock market tip worth a fortune.

The point of this story is: You, as a Canadian, can make yourself informed very fully and intelligently if you become a regular reader of THE FINANCIAL POST. You can make yourself a worthy companion and intimate of presidents and magnates. The world likes to listen to men who know something well, and who can talk interestingly and informingly on the subject of their study.

You can become worth listening to if you know your Canada well. And you can get the kind and amount of knowledge concerning Canada which will make you interesting to others if you will read THE FINANCIAL POST regularly each week.

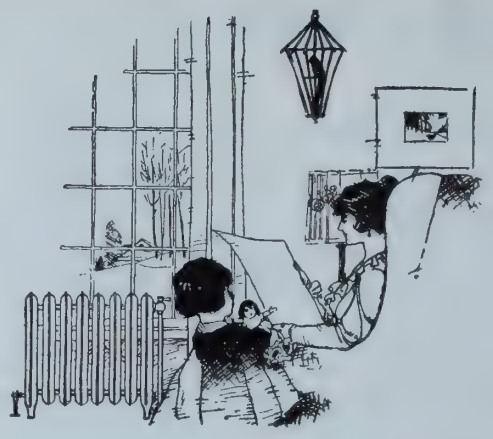
IF you read THE FINANCIAL POST REGULARLY you will find yourself keeping company with the highest paid staff of editors engaged on any publication in Canada—trained men who know how to make others know what they know and learn.

You will find yourself living in a most interesting world—the great, throbbing world of business. You will have your thoughts tremendously stimulated and helpfully directed. You will find yourself becoming a fit table companion for big men — this because you will have knowledge of a quality that will keep you from shame.

What is it that keeps you and THE POST separated? It cannot be its subscription price of $3. Probably it is because you are not very well acquainted with this paper.

We are going to put it to you this way: If you have the desire to be worthy of association with big men, then prepare yourself for such association by reading THE POST, and to make acquaintance easy, we provide the coupon below. It offers you THE POST for four months for a dollar bill.

- - - -



There's Plenty of Business

And best of all, you do not have to hunt for it. Every home, apartment house, office and factory is a prospect for the coal-saving Dunham Heating Service.

The volume of "change-over" work that you can do is limited only by your desire to go after it. Every coal user is eager to be told how to get more heat out of what coal is apportioned to him.

Just remember that coal is wasted by every heating system that permits the accumulation of air and water in the radiators. Burning more coal in such a system does nothing but increase the waste, and multiplies the knocking and pounding.

Since 1903 the Dunham Radiator Trap has been saving coal by automatically removing the air and water. It can be applied to existing steam heating systems without requiring extensive alterations. Architects everywhere recommend it.

Learn now about the Dunham Radiator Trap. Our engineers are specialists on heating and can be of considerable help to you. Work with us for a bigger volume of this profitable "change-over" business.

The Trap is only one element of the Dunham Heating Service, which is so broad in its scope that it covers practically every mechanical requirement of a good steam-heating system.



The Dunham Radiator Trap is furnished with special roughing in dimensions to replace imitating devices.

The DUNHAM HEATING SERVICE

C. A. Dunham Company

Toronto, Canada

HALIFAX, OTTAWA, VANCOUVER, MONTREAL, WINNIPEG, CALGARY.

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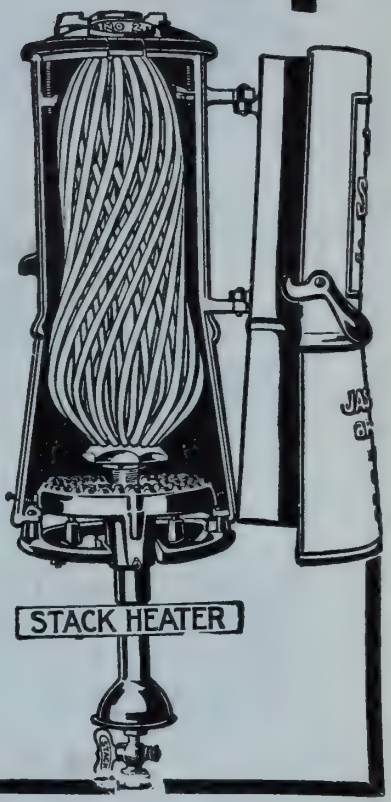
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Nut with Nut-Guards

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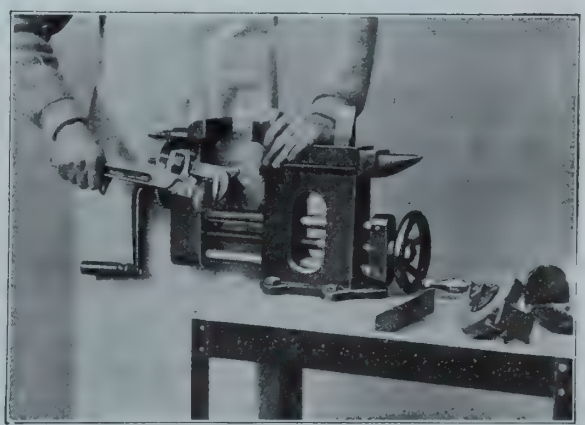
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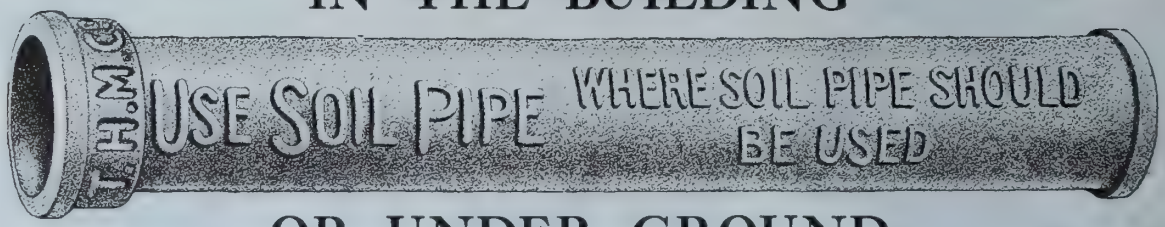
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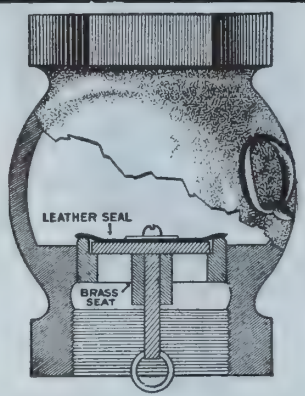


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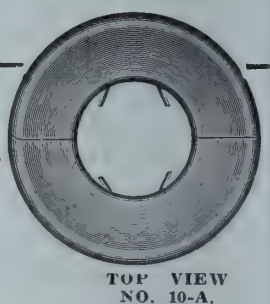
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And Save Fuel

Drive These Facts Home
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The thin waterways in the "King" mean quickly heated water, perfect circulation, and a SAVING IN FUEL.

Very shortly after the fire is lighted in a King Boiler hot water reaches the radiators.

Write for prices.

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AGENCIES IN ALL LEADING CITIES

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BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.
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Fig 106

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Fig. 108



Fig. 114

They are recognized as the Standard Steam Valves in all parts of the World, and wherever there are supply houses—Jenkins Bros'. Valves will be found. The Standard of quality never changes except to improve, and while to-day there are hundreds of imitators, the sales of genuine Jenkins Bros'. Valves are constantly increasing.

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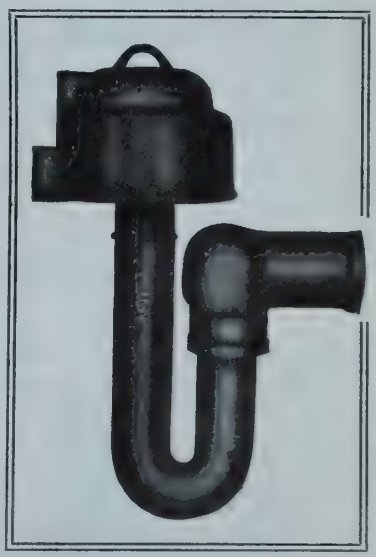
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One Man Can Thread up to 12 Inch.



Cuts Without Burring

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No. 1 cuts from ⅛″ to 1″
No. 5 cuts from ½″ to 2″
No. 10 cuts from 2½″ to 4″
No. 15 cuts from 4″ to 6″

Ratchet	Geared
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No. 25—1″ to 2″.	No. 61—2½″ to 6″.
No. 26—1″ to 2″.	No. 80—4½″ to 8″.
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To call your attention to the Famous B & C Floor and Ceiling Plates.
Our No. 15 style narrow flange designed for the Canadian trade.

One of many styles



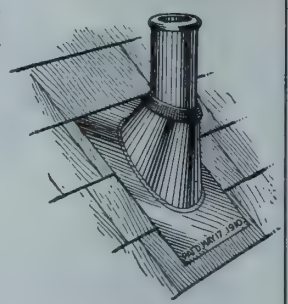
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Fits any roof from ½ pitch to flat—just slide it down the pipe and it will conform with the pitch of the roof.

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1-2″ to 4″

Black and Galvanized

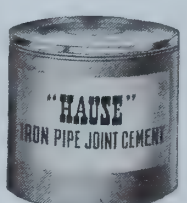
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"HAUSE" PIPE JOINT CEMENT

For steam, water, air, oil, gas, gaskets, etc. The cement that cements. Sets like gum. Allows no leaks.

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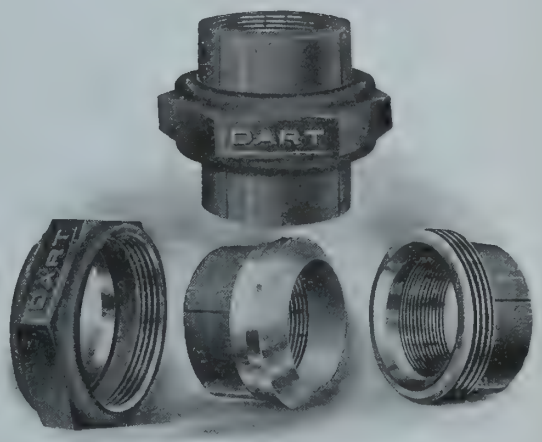
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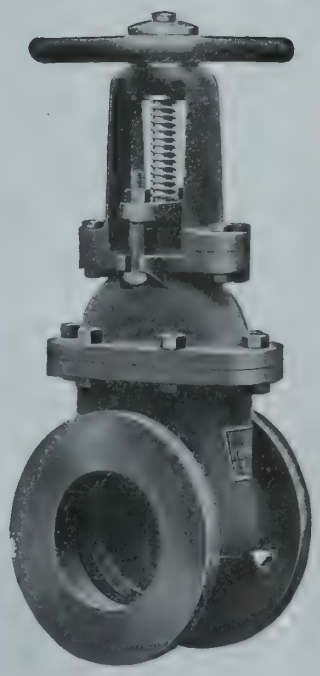
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Approved by the Fire Underwriters' Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

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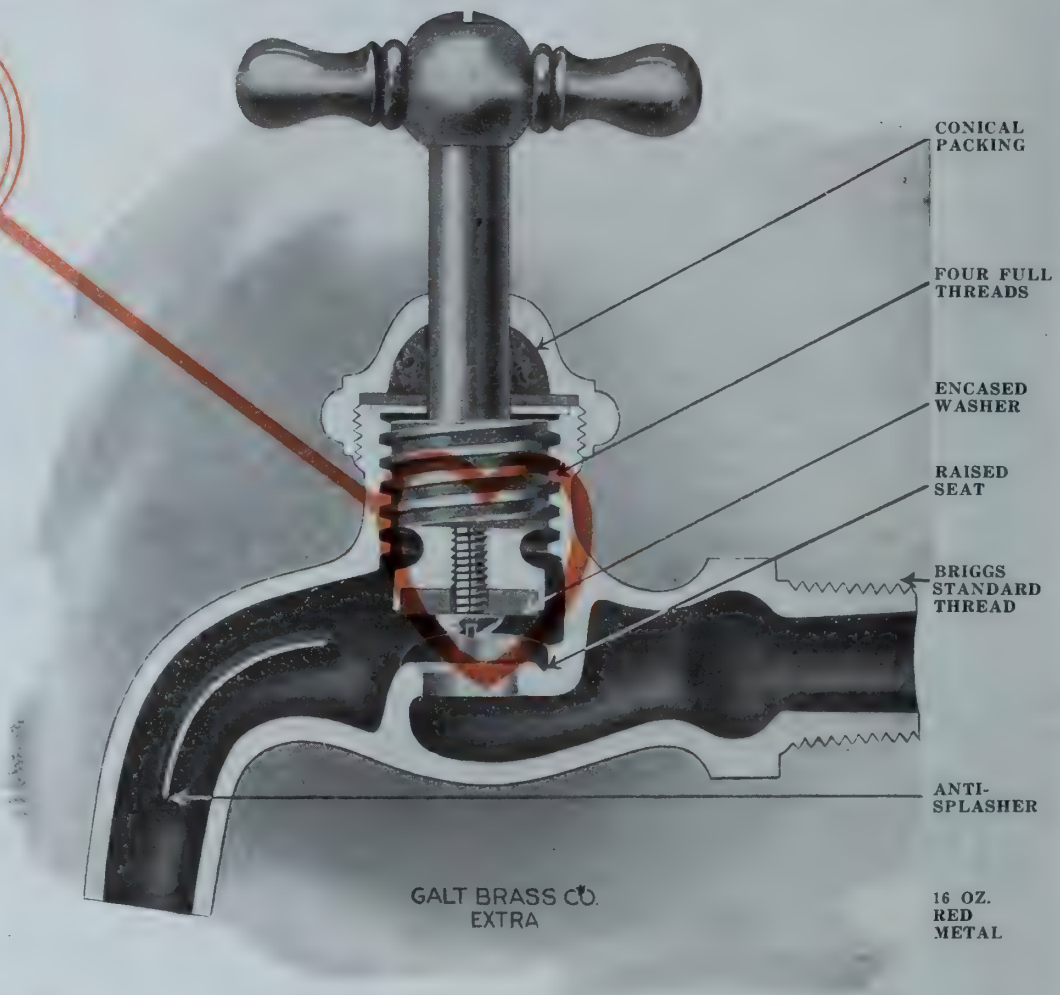
TRADE **PERFECTO** MARK

"GOOD" Washer

WARRANTY

Any article of our Manufacture proving defective will be replaced with TWO of its kind gratis.

Conical Packing, Four Full Threads, Encased Washer, Raised Seat, Briggs Standard Thread, Anti-Splasher, 16-ounce Red Metal



All *PERFECTO* Compression Work is now fitted with the GOOD MANUFACTURING COMPANY'S *GRAPHITE COMPOSITION SEAT WASHER.*

PERFECTO Compression Work is the only Compression Work made that is furnished with "GOOD" seat washers.

Having confidence in the Super-excellent qualities of *PERFECTO* products, the Good Manufacturing Company have entered into this arrangement.

Can you afford to be without PERFECTO Brass Goods?

Galt Brass Company, Ltd.

Galt, Canada

SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

Vol. XII. Publication Office, Toronto, October 15, 1918 No. 20

EMPIRE WATER SYSTEMS

Are BIGGER BUSINESS BUILDERS



EMPIRE Pneumatic Water Systems are proving every day to be the most satisfactory systems on the market. We have the proofs because of the repeat orders we receive.

Our customers would not send in repeat orders if their customers were not satisfied with the service rendered them by Empire Water Systems.

We issue a special catalogue in connection with rural and farm home plumbing requirements. If you have not got one, write us at once for this book. It is entitled, "The Old Way, the Empire Way." It also contains valuable information about sewage disposal systems.

Empire Manufacturing Co., Limited

LONDON TORONTO

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While



A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for BEAVER BRAND CAST IRON ENAMEL WARE

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

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Monarch Brass Mfg. Co., 71 Brown St., Toronto

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E. B. Plewes, 120 Lombard St., Winnipeg

CANADIAN CONSOLIDATED RUBBER CO. LIMITED
DOMINION
RUBBER
SYSTEM
AND ASSOCIATED COMPANIES

BELTING - HOSE - PACKING

The Dominion Rubber System has established a reputation for making *good* rubber products. That applies to Footwear, Tires, Raincoats, Druggists' Sundries or Mechanical Rubber Goods. In each case the quality is second to none and the workmanship of the best.

That is particularly true of our Mechanical Rubber Goods. Dominion Rubber System Belts and Belting, Hose and Packing, etc., for industrial use, "stand up" and do the work expected of them. In these lines, quality and service have been linked together to such a degree that absolute satisfaction is guaranteed.

If you have not proved the satisfactory service of Dominion Rubber System Belting, Hose and Packing, write to our nearest branch and ask for one of our experts to discuss your Belting, Hose or Packing problems with you.

Canadian Consolidated Rubber Co.
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HEAD OFFICE - MONTREAL

Branches at Halifax, St. John, Quebec, Ottawa, Toronto, Hamilton, Kitchener, London, North Bay, Fort William, Winnipeg, Brandon, Regina, Saskatoon, Calgary, Lethbridge, Edmonton, Vancouver and Victoria.

EXTRA QUALITY

Wolverine Red Sheet Packing

For Steam—For Hot Water—For Cold Water

Accept only the Genuine



Wolverine Trade-Mark on every piece

Highest Grade Packing on the Market
Rubber Goods Listed in Catalog "C" are dependable

Canadian Wolverine Company, Ltd.

CHATHAM, ONTARIO

PIPE THREADING TOOLS

It is Evidence Like This



"Toledo" Geared Adjustable Threading Tool No. 2 making a cut and thread on a 4-inch bend in position. It was desired to install a steam separator above throttle of engine, and the whole job was satisfactorily completed without removing the pipe line.

which proves the extra value of "Jardine" and "Toledo" Pipe Threading Tools

"Jardine" and "Toledo" Pipe-Threading Tools cut clean, sharp threads with a minimum of muscular effort. They permit of one man doing work which ordinarily requires two. But even more important than this, they will work in any odd corner. Instance the job illustrated in the accompanying engraving. Here is a case where, with an ordinary tool, the whole pipe line would have had to be taken down. The tool paid for itself on that one job.
Investigate "Jardine" and "Toledo" Tools yourself. Ask us to send names of users in your locality. Then go and talk to these men in your own business and learn what they think of these good tools.

A. B. JARDINE & CO., Limited, Hespeler, Ont.

Sole makers of "Jardine" Pipe-Threading Tools
Sole licensees to manufacture and sell Toledo Pipe-Threading Tools in Canada.
Agents, Winnipeg and West—Stanley Brock, Ltd., Winnipeg, Man.
Brockville and East—J. R. Devereux, 358 Beaver Hall Square, Montreal.
Belleville and West—W. H. Cunningham & Co., 183 Church St., Toronto, Ont.

Ruud Says, "Keep Up the Quality"

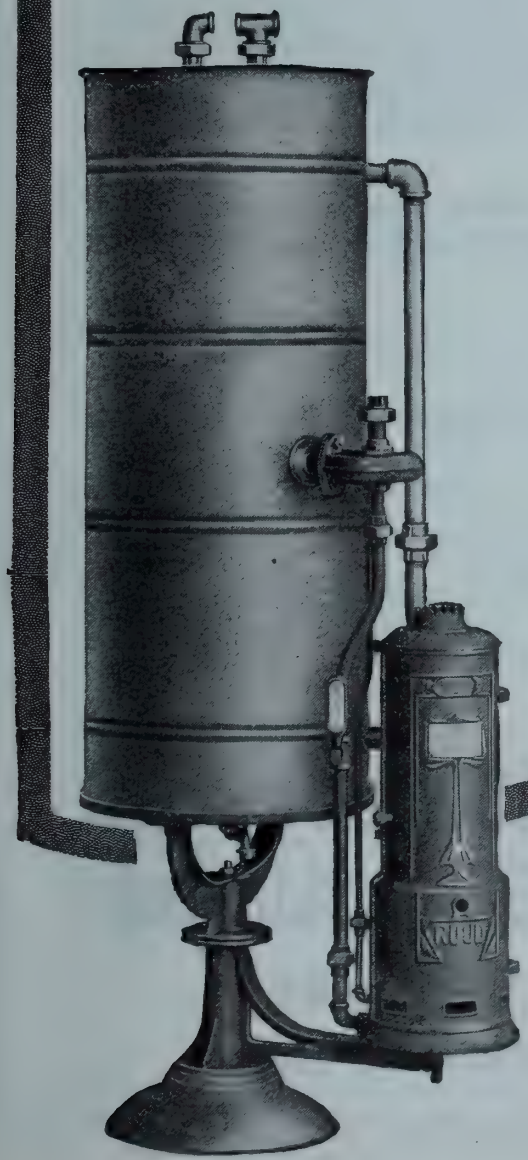
QUALITY of materials and workmanship is the thought in every Ruud manufacturing motion. Everyone on the Ruud payroll is told to keep that quality up. There is no lack of it. It is used generously in materials and labor. It is this quality, maintained rigidly for twenty years, that has built up the biggest water-heater business in the world.

Ruud Instantaneous Automatic Water Heaters,
Ruud Multi-Coil Storage Systems,
Ruud Tank Water Heaters,
Ruud Automatic Shower Valves,
Ruud Garbage Incinerators.

This war is not without its compensations for the master plumber. It has opened the door of straight merchandising and selling. That means a quick money turnover and good clean profit in handling and installing the Ruud line of appliances. Many a wise employing craftsman has turned to the Ruud line as a mainstay for 1918, or until peace brings the resumption of normal building activities. And the Ruud line is so staple, so necessary in the modern scheme of things, that when the guns do cease roaring these far-sighted men will have built a business that will continue permanently.

The Ruud Organization is the largest Water Heater organization in the world. Ruud service can be had in every city having gas in America. The Ruud line of water heaters is the most complete. It includes a type for every need, for every purse, for every kind of building. There isn't any other water heater literature as good as Ruud literature — from the educational or the technical point of view. Sell the Ruud Line because it is easiest and best to sell from your customer's standpoint and yours. Write for particulars.

RUUD MANUFACTURING COMPANY
371-381 Adelaide Street W.
TORONTO, CANADA

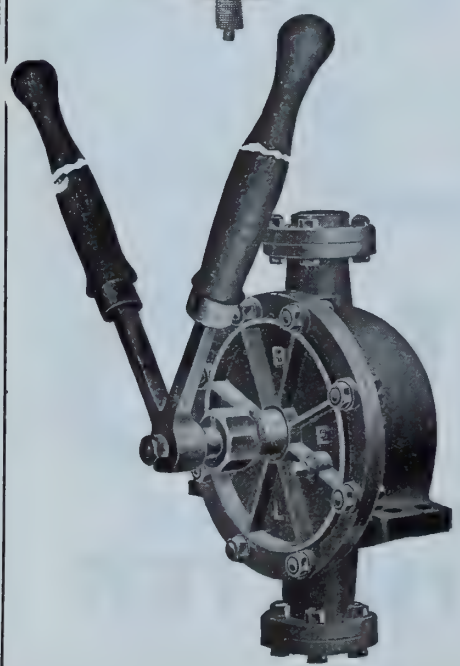


RUUD
AUTOMATIC GAS WATER HEATER









FIVE WORKS—OVER 3,000 EMPLOYEES

It is our intention after the War to devote our energies to the intensive production of the following Specialities:

Gunmetal and Brass Valves and Cocks.
Steam, Water and Compressed Air Fittings generally.
Cast Iron Stop and Sluice Valves.
Semi-Rotary Pumps.
Extruded Brass and Bronze Bars.
Brass Bolts and Nuts, Studs and General Turned Work from the Bar.
Cast and Malleable Iron Cocks and Pipe Fittings.
Pressure and Vacuum Gauges.
Injectors and General Jet Appliances.
Engine Governors (Pickering, Proell and other types).
Spraying Machines for Insecticides and Limewashing.
Coppersmiths' Work.
"Stella" Brand Alloys, Manganese Copper, Silicon Copper, Ferro Zinc, Phosphor Copper and Tin, etc.

Business After the War

If you are interested in any or all of the lines mentioned and are in a position to take a hand in the energetic distribution of the same, please communicate with us NOW to our Head Office at the address below.

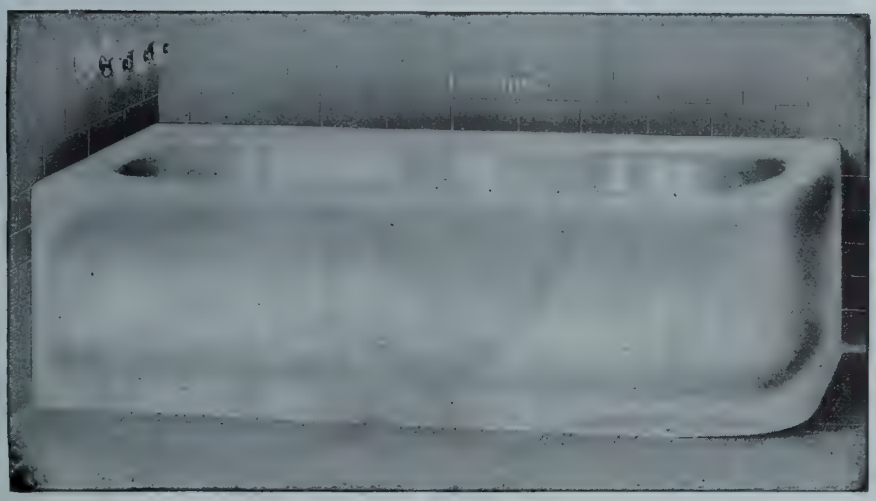
UNITED BRASSFOUNDERS and ENGINEERS, Limited

EMPRESS FOUNDRY

Cornbrook, Manchester, England

"Standard"
"Perfection" Built-In Baths

Made in One Piece Enamelled All Over



These Baths represent the last word in design and finish, and are made to build into Right or Left Hand Corner or into a Recess.

The "Perfection" Built-in Bath is only 17½ inches high, therefore convenient. It builds into walls and floors, the absence of all dust-collecting cracks and corners, meaning bathroom sanitation.

Made in 5 and 5½ foot sizes.

Illustrations on request.

Write the nearest dealer

Standard Sanitary Mfg. Co.
Limited

General Office and Factory, Royce and Lansdowne Aves., Toronto, Ontario

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Winnipeg Showrooms:
76 Lombard Street

Hamilton Store:
20-28 Jackson Street West

Montreal:
4 Beaver Hall Square

Calgary:
31 Canada Life Building

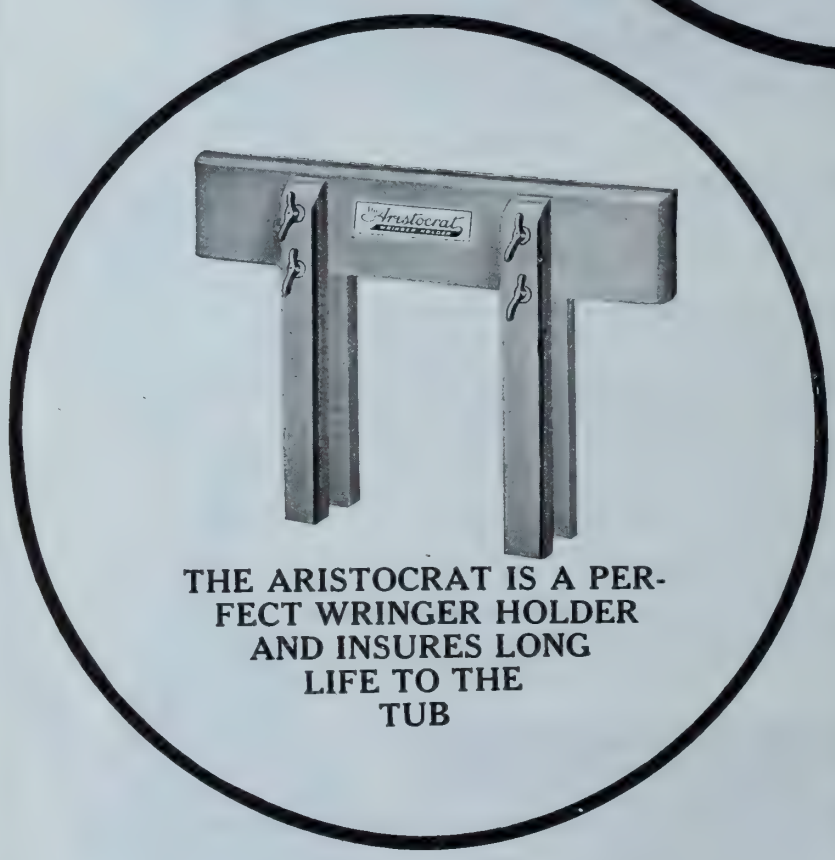
Vancouver:
847 Beatty Street

"MADE IN CANADA"

Every Feature and Every Ingredient Necessary To Make A Perfect Laundry Tub Is Combined In the "Aristocrat"

Ask for the Aristocrat Wringer Holder.





Every "Aristocrat"

you install will sell others for you. Let us send you a sample tub. You'll be convinced, as many a dealer before you has been.

PLUMBING SUPPLIES

We have everything for the plumber—large stocks always ready for prompt shipment.

Solder, Lead Pipe, Sheet Lead, Bath Tubs, Lavatories, Sinks, Lead Wool, "Aristocrat" Laundry Tubs, Iron Pipe and Fittings. All Brass Goods. All Ingot Metals.

EASY WIPING SOLDER IS THE PLUMBER'S FAVOURITE.

Write us for full information

THE CANADA METAL COMPANY, LTD.

Montreal Hamilton TORONTO Winnipeg Vancouver

WE HAVE EVERYTHING FOR THE PLUMBER

CATALOGUE "A" MAILED FREE

Burnham Boilers



Telling the truth about steam domes

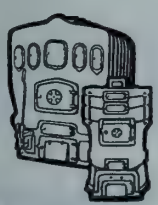
THE dome is the attic of the steam boiler. But it's no place for hair-cloth trunks and spinning wheels. The only thing that belongs in a boiler's attic is steam.

Steam has a persistent way of expanding. Attics give elbow room for that expansion. If there is not attic room enough, the water and the steam start tussling, and both go over into the pipes and radiators.

Water clogs the circulation and reduces economy. If too much "goes over" the boiler "burns."

The Burnham attic is ample. Compare the water section at the left with the clear space above the line in the steam section at the right. That's the Burnham's steam dome.

This, then, ends Burnham Boiler chat Number Six, of which there are eleven more to follow.



Lord & Burnham Co. Limited of Canada

(Boiler Department)

ROYAL BANK BUILDING, TORONTO

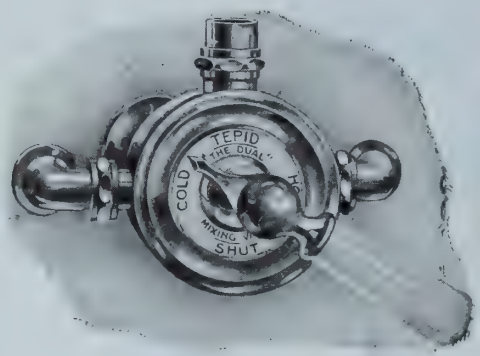
Factory: St. Catharines, Ontario

G. & W. G. GUMMER, LIMITED

EFFINGHAM BRASS WORKS,

And at
9 Fenchurch St.,
London

ROTHERHAM,
ENGLAND





"Dual" Mixer

A valve that really mixes Hot and Cold Water, and maintains a uniform mixture.

For ease of operation, simple construction and easy installation, it has set a new standard of efficiency.

Cold Water must be turned on first, no possibility of scalding.

Made in several forms for Showers, Sprays, Operating Rooms, etc.

At the well-known works of Messrs. Brunner, Mond & Co. these valves provide baths for 2,500 employees.

G. & W. G. GUMMER, LIMITED

Manufacturers of every description of

Engineers,' Plumbers' and Sanitary Quality Brassware

WE ARE HEADQUARTERS FOR HIGH GRADE GROUND KEY WORK

YOU cannot name one line of brass goods that can cause more trouble than a stop and waste cock that will not close off and waste at a moment's notice. It's a problem—but we have devoted considerable time and study in putting on the market the finest ground key stop and waste cocks on this continent, and we challenge all competition.

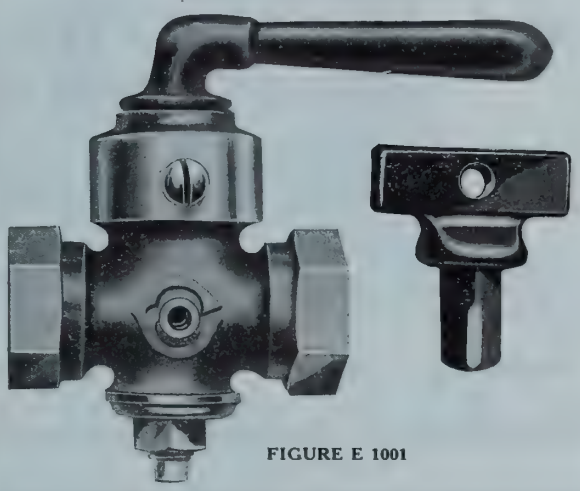


FIGURE E 1001



FIGURE E 1024

WE make a number of styles, all of which can be relied upon to stop waste when required. They are specially ground, perfectly fitted and are made of the finest red brass that money can buy. C.B. goods are made right. Quality and lasting service is our slogan. Let us furnish you with a trial order. We stand behind every piece of brass goods we make.

B.O.T. W.C. COMBINATIONS ARE HIGH GRADE

THE CANADIAN BRASS CO., LIMITED

Toronto Office: B.O.T. Building, 159 Richmond Street West

Galt, Ontario

Let us give you some real cash in advice



Read Well Our Proposition

THERE'S MONEY IN IT FOR YOU

When you figure on a job you **think** you know what to charge for your goods, etc., and you may **think** you know what a customer will pay.
But you can't pay your cheques through a bank on THINK cash balances. You've simply got to KNOW.

For about 10 cents a day we'll do the thinking for you. We'll watch your paying-out account in such a way as to ensure your bank balance being on the **know** side. We furnish prices to you regularly, and add on sufficient margin to cover all your expenses and pay you a profit on every transaction.

Don't Forget. Write us at once about this Service, hundreds have adopted it.

The Henderson Business Service, Box 123, Brantford, Ont.

HOYT METAL GOODS ARE KNOWN

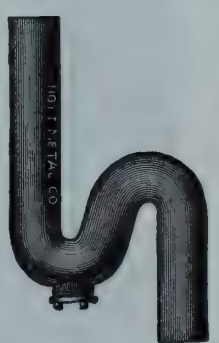
FROM COAST TO COAST



As time-savers there are none equal to our Wiping Solder, Bar or Wire Solder.

Hoyt Lead Traps, bends and waste pipe are in a class by themselves.

All our products are made to formula.



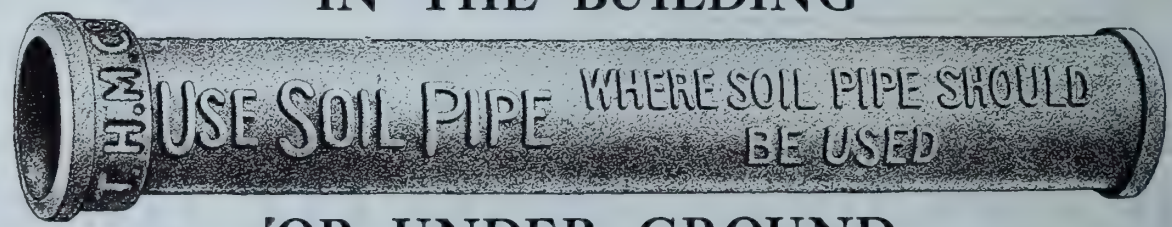
Our Mixed Metal Sales Amount To Over $5,000,000 Annually.

Write your Jobber

HOYT METAL COMPANY, TORONTO, ONTARIO
New York, N. Y., London, Eng., St. Louis, Mo.

Write Us

IN THE BUILDING



OR UNDER GROUND

ASK YOUR JOBBER FOR T.H.M. CO. BRAND OF SOIL PIPE AND FITTINGS.

TORONTO HARDWARE MFG. COMPANY, - Toronto, Canada

WE MANUFACTURE A FULL LINE OF HIGH-GRADE RANGE BOILERS



There's Money In IT for YOU!

Heating Engineers will welcome this, the latest and greatest invention in connection with their profession.

"A 'perfect' heating system."

That is the only description that can be given to the "Dodd Heating System"—eliminating, as it does, all the faults and shortcomings of the coal-fired boiler.

THE DODD GAS HEATER

Fired by gas (the cleanest of fuels); automatically controlled and regulated by a Thermostat. Constructed on scientific principles—fool-proof—and above all economical in operation, the "Dodd" is the ideal heater—it may be used wherever a hot-water, steam or vapor system is installed.

The owner of a Dodd Gas Heater has no furnace trouble—no cellar work.

To obtain heat, it is only necessary to light the pilot-light—set the Thermostat to the degree of heat desired—and leave the Dodd to do its work. It will "carry on" night and day—week in, week out—throughout the Fall, Winter and Spring, burning only sufficient gas to give the necessary heat.

We have faith in our product—a mighty faith. We have tested the Dodd Heater under all conditions—and can show you recording charts, fuel-consumption accounts, consulting heating engineers' certificates. Moreover, we are prepared to give a strong guarantee with every Dodd Gas Heater.

Your clients want to know about this perfect heating system—we want you to tell them all about it. In order to do this, you must investigate our claims—and understand our system. Spend a little of your time in making an investigation.

We will advertise this Heater extensively. You will be questioned by your clients—have your information ready. Be posted. Know the fine points of our system, so that you can talk it intelligently.

Co-operate with us in introducing to the public the ideal heating system—one that will bring you added prestige and substantial profit.

We will help you in every way possible—let us explain our sales plan.

THE DODD HEATING SYSTEMS LIMITED

34 VICTORIA STREET - - - TORONTO, ONTARIO

Becoming a Bigger Man

WHAT is the difference between some men you know and others known to you? Why are some men earning $3,000 a year and some $30,000? You can't put it down to heredity or better early opportunities, or even better education. What, then, is the explanation of the stagnation of some men and the elevation and progress of others?

We are reminded of a story. A railroad man, born in Canada, was revisiting his home town on the St. Lawrence River. He wandered up to a group of old-timers who sat in the sun basking in blissful idleness. "Charlie," said one of the old men, "they tell me you are getting $20,000 a year." "Something like that," said Charlie. "Well, all I've got to say, Charlie, is that you're not worth it."

A salary of $20,000 a year to these do-nothing men was incredible. Not one of the group had ever made as much as $2,000 a year, and each man in the company felt that he was a mighty good man.

Charlie had left the old home town when he was a lad. He had got into the mill of bigger things. He developed to be a good man, a better man, the best man for certain work. His specialized education, joined to his own energy and labor sent him up, up, up. To put it in another way: Charlie had always more to sell, and the world wanted his merchandise—brain, skill and ability. Having more to sell all the time, he got more pay all the time.

Charlie could have stayed in the old home town; could have stagnated like others; could have been content with common wages. In short, Charlie could have stayed with the common crowd at the foot of the ladder. But Charlie improved himself and pushed himself, and this type of man the Goddess of Fortune likes to take by the hand and lead onward and upward.

Almost any man can climb higher if he really wants to try. None but himself will hold him back. As a matter of fact, the world applauds and helps those who try to climb the ladder that reaches towards the stars.

The bank manager in an obscure branch in a village can get out of that bank surely and swiftly, if he makes it clear to his superiors that he is ready for larger service and a larger sphere. The humble retailer can burst the walls of his small store, just as Timothy Eaton did, if he gets the right idea and follows it. It is not a matter of brain or education so much as of purpose joined to energy and labor. The salesman or manager or bookkeeper or secretary can lift himself to a higher plane of service and rewards if he prepares himself diligently for larger work and pay. The small manufacturer, the company director, the broker—all can become enlarged in the nature of their enterprise and in the amount of their income, — by resolutely setting themselves about the task of growing to be bigger-minded men.

Specialized information is the great idea. This is what the world pays handsomely for. And to acquire specialized information is really a simple matter, calling for the purposeful and faithful use of time. This chiefly.

One does not have to stop his ordinary work, or go to a university, or to any school. One can acquire the specialized information in the margin of time which is his own—in the after-hours of business. Which means: If a man will read the right kind of books or publications, and make himself a serious student at home, in his hours—the evening hours or the early morning hours—he can climb to heights of position and pay that will dazzle the inert comrades of his youth or day's work.

IF business—BUSINESS—is your chosen field of work, we counsel you to read each week THE FINANCIAL POST. It will stimulate you mentally. It will challenge you to further studious effort. It will give you glimpses into the world of endeavor occupied by the captains of industry and finance. With the guidance of the POST, and with its wealth of specialized information, you, a purposeful man, aiming to go higher in life and pay, will find yourself becoming enlarged in knowledge and ambition, and will be acquiring the bases and facts of knowledge which become the rungs of the ladder you climb by.

It is the first step which costs. But this cost is trivial—a single dollar. We offer you the POST for four months for a dollar. Surely it is worth a dollar to discover how right we are in our argument. If you have the will to go higher in position and pay, sign the coupon below.

THE MACLEAN PUBLISHING COMPANY, LIMITED,
Dept. S.E., 143-153 University Ave., Toronto.

Send me / us THE FINANCIAL POST for four months for one dollar.

Money to be enclosed / remitted

Signed .....

.....

MORE HEAT WITH LESS COAL



Help All You Can To Win The —WAR—

If you show your customers how to save 15 per cent. in coal and at the same time create more heat, you are helping to win the war, hence it is a patriotic duty to show him how.

JUST READ THIS

One of our customers installed a number of so-called heat generators as a try-out on a certain sick job. They would not work and were taken off. The owner became disgusted and would try no more. But in the end we prevailed upon him to install a **Clark Temperature Booster,** and it did the trick.

CLARK TEMPERATURE BOOSTERS

are not appliances that will increase the temperature of the water in a heating system for a short time and finally become ineffective, like most so-called heat generators. They work all the time and always.

There are no fluids, no springs and no corrosive substances in the make-up of the **Clark Temperature Booster,** and once installed they become the most valuable piece of mechanism on the heating system.

Here's another feature that is embodied in the Clark Temperature Booster. It is so perfect and so well balanced in every way that one size will handle any job. No need to question that statement. We guarantee it to improve every gravity hot water job, no matter how large it is.

GALT BRASS CO.
LIMITED

Galt - Ontario
Canada

EVERY JOBBER HANDLES CLARK TEMPERATURE BOOSTERS

PORT HOPE

Sanitary Mfg. Company

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Makers of

Plumbers' Fine Enamelware

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FACTORIES:

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Toronto, Ontario	- -	119 King St. East
Winnipeg, Manitoba	- -	405 Tribune Building

SANITARY ENGINEER

VOL. XII. OCTOBER 15, 1918. No. 20

Wrought Iron Versus Cast Iron Pipe

"Sanitary Engineer's" Prophecy Comes True — One of the Largest Hotels in Canada Takes Out Wrought Iron Soil, Waste and Drainage Pipes and Replaces Same With Cast Iron Soil Pipe and Fittings—More Buildings to Follow Example

IN the December 15 issue, 1917, on page 13, we published a list of buildings in Winnipeg in which wrought iron pipe had been installed for conveying soil waste and drainage from said buildings to the public sewers. We stated that at no very distant date we would be telling our readers that cast iron soil pipe would be used to replace the wrought iron pipe where used for the purpose named. But we had no idea how soon the prophecy of SANITARY ENGINEER would come true. The accompanying views are taken from photographs specially procured for SANITARY ENGINEER and we have specimens of pipe in our possession from which the photos were taken.

One of the largest hotel buildings in Winnipeg is having the plumbing all remodeled, and cast iron soil pipe and fittings are being installed to take the place of the wrought iron pipe which was previously installed. This latter was installed in the year 1905, a matter of 12 years, and there is plenty of evidence to prove that the pipe was rendered unsafe for a considerable period before the deficiencies were found out.

There is, however, one thing that must be said regarding this particular installation: First, that from reports received the pipe turns out to be more of a steel pipe than wrought pipe; second, that most commercially known wrought pipe is sold as wrought iron pipe, and contains a high percentage of steel. This, of course, accounts for the rapidity of corrosion in so-called wrought iron pipe. Another point, too, is this: In connection with the particular installation we are referring to the specifications distinctly stated that the soil and waste pipes shall be wrought iron pipe, and as a matter of fact this turns out to be steel, according to reports received by SANITARY ENGINEER.

Now, this latter point is a very important one to every sanitary and heating engineer, in this way: Suppose one sanitary engineer tenders on a job and he quotes on genuine wrought iron pipe, whether black or galvanized his tender is likely to be very much higher, which puts him at a disadvantage as against the other tenderers, who take any old kind of pipe, so long as it is wrought pipe, the product of a rolling mill.

This is not honest, it is not fair and the manufacturer of wrought pipe, who is content to sell pipe of any questionable formula for wrought iron, or even steel, is not conducting an honest business if he knows himself that either pipe could honestly claim, chemically, to be neither wrought iron or steel, viz., a mixture.

There is also another question which must be faced sooner or later and that is the life of materials used by this trade when used for certain purposes, and we must not be carried away with any such terms as "Commercially known" wrought iron pipe, but rather chemically known, because we all know that the term "Commercially known" is a misnomer, while "genuine" or "chemically pure" or even pipe sold per stated formula would be some definite term. And furthermore, such terms would, being definite, give the purchaser of such pipe a good idea as to the life of the pipe under certain conditions, or purposes for which the pipe was to be used.

Since the information received regarding the replacing of pipe in the hotel in Winnipeg we have learned of other buildings in different parts of Canada in which wrought iron pipe used for soil and waste pipe is in a dreadful state of corrosion, though it has not quite reached as yet such a dangerous condition as to permit sewer air entering the buildings. SANITARY ENGINEER is ever on the lookout for each and every case and will from time to time report to our readers just how matters stand.

One other matter which would have a great bearing upon the question of right and wrong kind of material to use for certain purposes would be the annual inspection of all plumbing. If manufacturers of goods used in the plumbing trade knew that their goods were to be either inspected or tested, or both, according to the condition they were found to be in, they would make goods that would last. At the same time the prices of goods, no doubt, would be more, but all goods would have to bear the same "light of day inspection" and no undue advantage would be given one over another. Another thing, too, the sanitary engineer would not be liable to cut, cut, cut, on the price or be tempted to instal inferior goods. Competition would be based clearly and positively upon real skill and business management, instead of as at present. Referring to the annual inspection of plumbing, which is almost a subject of itself, here would be a splendid opening for our returned wounded soldiers. Men who, previous to the war, were engaged in the plumbing and heating business would make good and practical inspectors and their previous skill could not be better employed than in protecting the public from the use of inferior goods or impractical installations.

EDITOR'S NOTE

This article should have appeared in the last issue of SANITARY ENGINEER and was referred to in an editorial of that issue on page 21. But through an oversight the article was omitted. However, it will be none the less interesting to readers of SANITARY ENGINEER and will prove to each one who has been following up the controversy that SANITARY ENGINEER has indeed accomplished much in fighting for the interest of the trade and the public at large. There can be no doubt but that cast iron soil and waste pipe is here to stay at least until such time as some other material has proved itself by actual experience to be better.

It is no sacrifice to invest your money in Victory Bonds.







Being Replaced With Cast Iron Soil Pipe and Fittings

In connection with a series of articles that have appeared in SANITARY ENGINEER entitled "Wrought Iron versus Cast Iron" for soil waste and drainage purposes, the above illustrations were procured.

The pipe is being taken out of one of Canada's largest and most modern hotels. The specifications called for "Wrought Iron Pipe," but we have reason to believe that it is steel pipe. The contract for replacing above kind of pipe runs into a figure around $50,000, and cast iron soil pipe and fittings are being installed.

The building has only been up about 12 years.

Buying Victory Bonds is only lending money to yourself—and getting interest for so doing.

Possibilities Ahead of the Gas Industry

Some Splendid Food For Thought For Every Sanitary and Heating Engineer — With Gas Consumption Increasing, the Sale of Gas Appliances Must Also be on the Increase

By GEO. W. ALLEN, Secretary-Treasurer of Canadian Gas Association

The writer's own opinion regarding the solution of the fuel problem for the future can be stated in a few words as follows: "Wood fuel should only be used by people in closest proximity to the source of supply, and that no coal be allowed to be shipped to centres where there is an abundant wood supply. Coal, especially bituminous coal, brought into the country, as well as that mined in the country, should be turned over to gas manufacturing companies or coke oven plants, and the gas content released and sold in such centres and towns where it is not convenient to get a coal or wood supply. The gas could also be distributed in as large an area as possible for domestic, industrial and other heating purposes at a low price, while the coke would be sold in centres not conveniently situated to the coal, wood or gas supply, as well as being utilized in metallurgical, foundry and smelter operations, and, if necessary, for the generation of steam power in our industries. Peat fuel, as brought out before, can best be utilized for producing gas and this gas sold for heating purposes.

An editorial in the July 20th issue of "Scientific American" says in part, "We are told that ships will win the war, that food will win the war, that coal will win the war. So they will if they get a chance. The ships, food, coal, are all inanimate and impersonal, and the only way in which they can be put to work for the winning of the war or the achievement of any other purpose is by the hands of man. It is only through the agency of human labor that ships or food, or coal can be produced or used; so when we come right down to rock bottom it is individual effort that is going to win the war and nothing else."

"Non-existent is the man whose individual efforts have no bearing upon either the production or the use of some necessity of war, for at the very least we all eat, and eating consumes food, and food is one of the very biggest potential agents of victory. So it behoves every individual to put forth every possible effort to place production safely ahead of consumption.

"Some can do more than others, for some hold positions of more responsibility than others. We are all too wont to ask, 'What is the use of saving a shovelfull of coal, when another can save a ton? or What is the use of unloading a single car of coal earlier when we see whole trains remaining unmoved for days at a time? or What is the use of keeping a handful of food out of the garbage barrel when whole shipments of fruit go bad through somebody's negligence? or What is the use of cultivating this tiny patch here when that large one over there is held unproductive through shiftlessness or absentee ownership?' In every case is the answer, that 'A big wrong and a little one do not make a right,' but rather combine to make a bigger wrong. The use of saving a shovelfull of coal is that shovelfull; the business of the man with the shovel is to save his shovelfull, not to worry what the other fellow is doing with his tons of coal."

Our best national effort is the sum total of our individual efforts. The man who measures his effort up with that of some one else is not giving his own best effort, and until he sees the errors of his ways and mends them our national effort is not a maximum. Every little bit added to production or withheld from consumption is an object in itself. The individual effort that will win the war is the individual effort of every American."

A few extracts of an article entitled "European Practice in Fuel Conservation," by E. Piernet, published in the August 1st issue of the *Gas Age*, states in one part that "V. Cambon, in a work dealing with these matters makes the statement that the burning of coal direct under a boiler was like unto the practice of barbarous ages."

Mr. E. Piernet also states in his article that "The war, with its accentuated need for conserving coal, has made this policy all the more necessary for every country, especially so for France and Italy, who feel the lack of coal more than any other country with the exception, perhaps, of Switzerland, which is almost entirely dependent on outside supplies of coal. It is of the greatest importance to utilize the coal deposits as exhaustively as possible. At the present time this should be done in order to face abnormal and strenuous conditions in the best way; in the future, in order to enable the countries to take their proper place in the economic evolution of the after-war period of expansion and reconstruction.

"When we consider that many private power plants and many central stations, even those most up to date and efficient, burn coal under their boilers and in their furnaces, letting the by-products just enumerated escape out into the open air through their smokestacks, one can easily comprehend why certain industries like the gas industry and some farsighted engineers have been working so eagerly against these methods that use coal for direct firing. It seems almost as if one might actually consider the production of electric current for power use as a by-product of the industry whose utilization of its by-products is one of its chief features.

Hard as this may sound to the electric industry and the central station, it might appear advisable for all the great power stations to carbonize their coal first in order to draw from it all the valuable by-products that have been enumerated above. After the recovery of the by-products the red hot coke might be charged as fuel on the grates under the big steam boilers that are to supply the power to the prime movers which in their turn operate the big dynamos. The surplus gas recovered could be used for gas engine fuel. In the normal coke oven plant only about 50 per cent. of the gas produced is used for heating the retorts; a portion of this heat escapes through the chimneys and quite a percentage of this wasted heat might be used by suitable conduits that pass the waste heat to the boilers that ordinarily would be heated by coke.

"It seems that the two great competitors of modern times, the gas works and the electric central station, are approaching each other more and more and that the near future will see a partial junction of the two power, light and heat producers which will supplement each other to the welfare of the community and the conservation of national resources."

Messrs. Chester G. Gilbert and Joseph E. Pogue in an article, entitled, "Our National Coal Supply and Its Utilization" —results of an investigation conducted by the U.S. National Museum, including an analysis of the present fuel situation, showed the possibilities of the gaseous fuel, also making an analysis of the present fuel situation. An article published in a recent edition of the *Gas Age*, states in part:—

"Although the municipal gas plant now meets rather inadequately only a small share of the fuel needs of the community which it serves, it represents an established activity which can be converted into an organization that will supply all the fuel, whether gaseous or solid, that the community consumes. The transformation may retain the gas mains and much of the other equipment of the present type of plant, but in the place of the present procedure with relative neglect of by-product recovery will be substituted a by-product system of coal distillation, producing artificial anthracite, gas, ammonia, benzol, and tar. This will mean in each city a centralized purchase and consumption of raw coal, and a centralized distribution of products. The output will be limited, at first at least, by the demand for solid fuel. A production of ample

If you don't buy Victory Bonds you are getting into debt.



Fig. 1

Fig. 1 Gas fired die and tool making furnace and metal melting apparatus

Fig. 2 gas fired varnishing ovens. Heat is under scientific control.



Fig. 2

solid fuel will give an excess of gas over that now produced, which will call for an expansion in the use of gas, both in the home and industry. Such expansion will come as a result of cheaper gas, incidental to the proposed plan of production, together with improvements in methods of utilization; and this very expansion will cut down the use of solid fuel and thereby hasten the adjustment. The three remaining first-products, ammonia, benzol, and tar, as already pointed out, have an unlimited field of usefulness as such, even within the municipalities; and by shipment will contribute a supply of raw material to the needs of the coal-products industry, thus permitting and inducing this important field of endeavor to advance beyond the limits now imposed upon it by the coke industry."

An article published in the *Gas Age*, issue of August 1st, 1918, says:

"Mr. Wm. M. Booth, recently told the American Institute of Chemical Engineers that 'much larger central gas plants will form the solution of the fuel problem in the cities, the overhead expense of which will be proportionately less as they increase in capacity.'" For comparison with other forms of fuel he gives the relative amount of heat units in gas which can be purchased for a dollar in the following table:—

	B.t.u. per $1.
Bituminous coal (13,500 B.t.u. per lb.) 200 lbs. for $4	6,750,000
Anthracite coal (13,500 Bit.u. per lb.) 2000 lbs. for $8	3,375,000
Seasoned hardwood (4,000 B.t.u. per lb.) 4 ft. cord for $8	2,700,000
Natural gas (1,000 B.t.u. per cu. ft.) per 1,000 cu. ft. 30c	3,333,000
City gas (600 B.t.u. per cu. ft.) per 1,000 cu. ft. one dollar	600,000
Crude oil (1,900 B.t.u. per lb.) per barrel $4	1,615,000
Electricity, per kilowatt hour, eight cents	4,266
Electricity, per kilowatt hour, one cent	34,128
Alcohol (95 per cent. vol.) per gal. of 6.58 lbs., for one dollar	78,302

So, you see, applying the principle to the development of the gas industry, by being careful of the little things, and doing them right, as we go on from day to day, the bigger things will be able to take care of themselves. For it is well said that "Trifles make perfection, but perfection is no trifle." We can all do something, little though the individual effort may be in itself, to help along the gas industry in which we are engaged. The future will only bring to us what we put into it to-day.

Concluded

J. J. HILL ON THRIFT

"Thrift is not a virtue of to-morrow, but of to-day. The young man who puts off until he is earning a larger income or has satisfied some present want, or for any other reason, the effort to spare and accumulate is pretty sure never to begin unless under the pressure of misfortune. And it is really true that only the beginning is difficult. The first fifty or one hundred dollars are slow to gather, and look unimportant even after they have been saved, but there is magic in the fact. The income from investment, however trifling, confers a sense of power and carries a promise that allures. More important than all, a habit of saving has begun to push a sprout through the crust of indifference and self-indulgence. Independence in character asserts itself. Purpose strengthens. Possibilities apear. Thrift is a rare discipline in self-control. Presently there is a new man and a new force in the world.

"Thrift ought to be taught as part of the alphabet of virtue. Unless a young man has learned it before he is thirty years of age the chances are that he will remain all his life among the incompetents, the spenders and the wasters. Every man who has saved a dollar has cut one solid step in the face of a precipice, where he may momentarily stand. Without it he would presently fall into space and be forgotten. Resting on it he can cut another foothold, broader and more secure. And so all heights are scaled. This is an old prescription for material, mental and moral advancement; but it has been the law of the world from the beginning, and there is no reason to think that it will ever be superseded or that it can ever with safety be defied."

A SPLENDID BOOK

One of the most interesting books ever published by the A. W. Shaw Company, Chicago, is one just off the press entitled, "The Motor Truck as an Aid to Business Profits." It contains over 500 pages of "real meat," describing in a very readable manner how the motor truck is solving the delivery and transportation problem of large and small concerns, and contains a mass of charts, figures and illustrations. Those interested in the motor truck, desiring also to know of real experiences, will do well to write the above publishers for further particulars.

The Sale of Specialties

Small Thermostats For Gas Water Heaters Can be Sold by Every Sanitary Engineer—A Specialty Long Neglected—Big Demand in Every Section For Use on Storage Systems

By L. R. MENDELSON, Cleveland, Ohio.

THE expanse of this field is so vast, and the opportunities for new business so great, that during these times when the trade is looking for lines that will make "New Business from Old Buildings," a little time spent on studying thermostats will prove profitable to every reader.

There are only two reasons why a thermostat is not sold with every tank heater, as against dozens of reasons why they should be sold. The first applies to the seller and the second to the consumer; the former because he lacks the knowledge regarding the working of a thermostat and what such a specialty can be expected to accomplish. Once the sanitary engineer or seller understands how to satisfactorily install and regulate a thermostat he will find the consumer waiting for him.

The reasons why the trade has never taken to thermostats as they should has been due to troubles they have had with thermostats of the past, and the lack of familiarity with the thermostats of the present.

The old troubles were due in part to a faulty principle of construction—and to be successful with a thermostat you must have a fair knowledge of the why and wherefore of its operation. Besides the faulty principle formerly adopted there were so few sanitary engineers who understood how to properly regulate a thermostat.

The majority of present thermostats have overcome the old trouble, and thermostats are now made as near perfection as possible. It is up to the person installing them to know how to properly install and adjust them, as almost every complain received is caused either by faulty installation or adjustment. The records of complaint kept in the offices of the various manufacturers will bear out this statement. Of course, there are many makes of thermostats that are so complicated that it is scarcely reasonable to expect one to be thoroughly familiar with them all, but the underlying principle is the same.

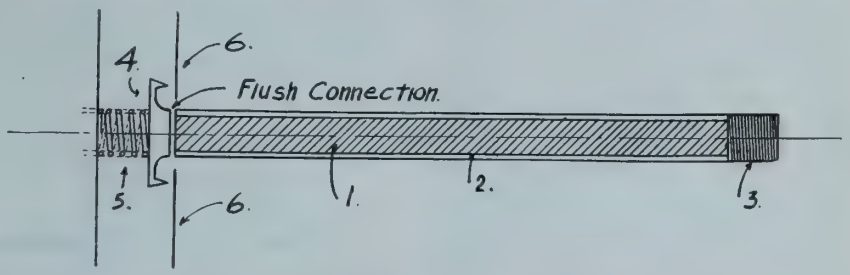


FIG. 1

Possibly a word about the old type will be interesting and instructive. The valves in most of them were attached to a rod which connected to the end of a copper tube into which the rod inserted. When the copper expanded it pulled the valve shut. But the point overlooked by the makers was that after the valve had closed, the water continued to get hotter, either from the by-pass flame being set too high or because the valve was set in winter time when the heater was very cold, and in the summer the warmer water heated to a higher degree of temperature. By getting hotter the copper tube expanded further against it. Something had to give to the strain of expansion. The result was that every time the valve closed it had to travel a little further, which meant hotter water, until eventually it didn't close at all.

Another reason why the old type thermostatic valves were not successful was that they were too difficult to adjust. To get at the adjusting parts it was necessary to close the meter, and the valve was then regulated by guess—then the person installing or regulating such a type of thermostat would have to wait until the water in the tank got hot and the thermostat closed. And if it didn't work just right he had to do it all over again. He could never set it just where

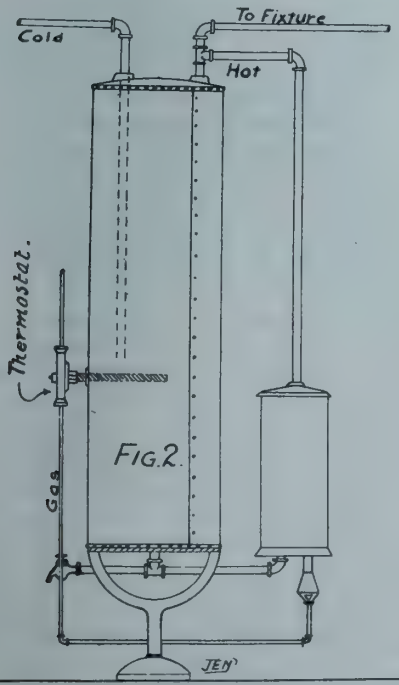


FIG. 2.

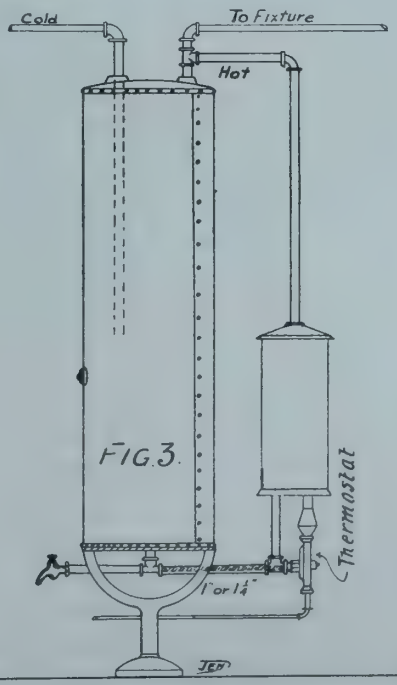


FIG. 3.

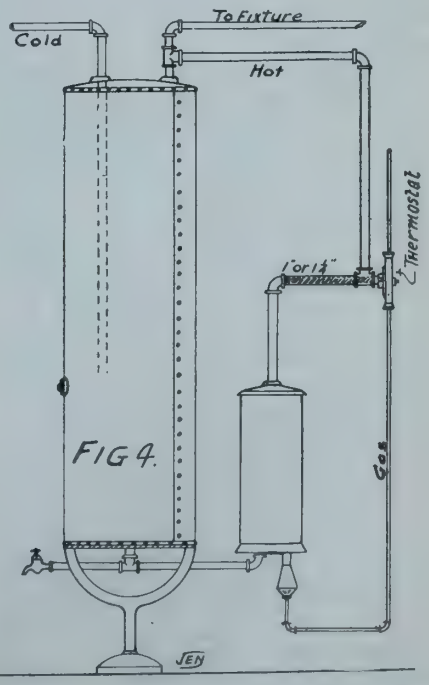


FIG 4.

You are being paid for taking money out of one pocket and putting it into the other.

he wanted it, and he spent more time than the job was worth. Contrast this against present valves that can be perfectly regulated on a cold tank in two minutes without shutting off the gas, and you can understand that vast improvements have been made with thermostats in the past few years. The old defect of straining the valve has been remedied by making the valve independent of the non-expansive rod and the use of a spring.

When the copper rod expands in the present makes it permits the spring to close the valve to its seat—when the copper rod contracts, it pushes the non-expansive rod against the valve and lifts it off its seat. After the valve is closed no further amount of expansion could strain the valve, as a break occurs between the non-expansive rod and the valve—the only contact they ever have is by a flush connection.

The old basic principle is still in use, that of expansion and contraction, applied with the relative difference of expansion and contraction of different materials. Copper has been found to be the most practical material to use as the expansive factor, while carbon, porcelain, wood, steel, etc., is the usual non-expansive medium. Sometimes fluids are used as the expansive factor against a metal that is relatively non-expansive. The expansion and contraction takes place through the heating and cooling of the water. How this works is shown in Fig. 1.

No. 1 is a non-expansive rod placed in a copper tube 2, having a solid end 3. Let No. 4 be the valve and 5 the spring which is pressing against the valve 1. When the copper tube 2 is heated, the relative difference of expansion between 1 and 2 will let the spring push the valve and rod 1 further in. By cooling the copper tube 2, it will contract and push the rod and valve out against the spring. Suppose 6 is the seat of the valve. When the tube expands it will permit the spring to press the valve to its seat. Now, suppose the copper tube is heated to a higher temperature and expands further—all that can happen is that the flush connection between the valve 4 and rod 1 will be broken, and nothing is strained.

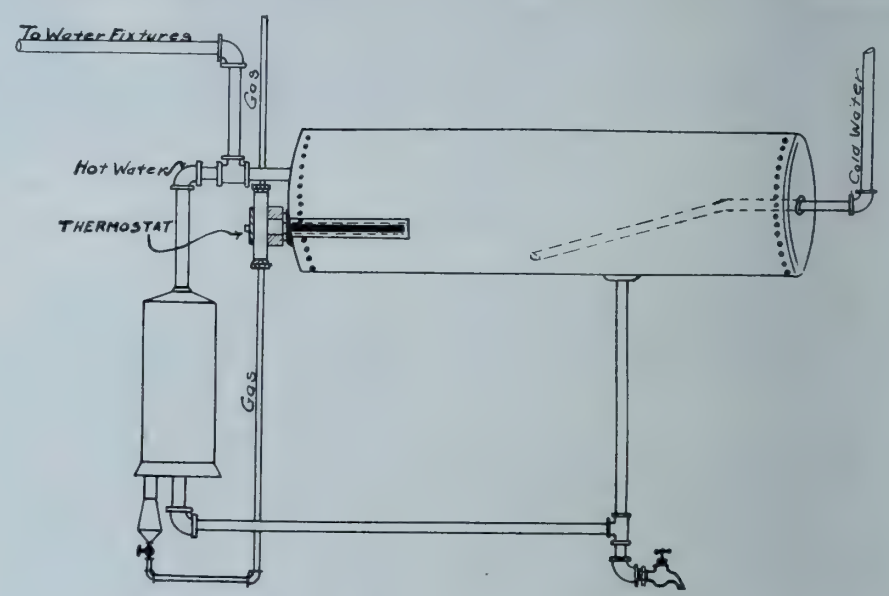
This is the principle used to-day. Sometimes the action is compounded through the use of levers, and in different valves there is, of course, some difference in the materials used and the methods of adjustment, but the basic principle is the same. It must be understood that a thermostat operates on just a few thousandths of an inch, and for this reason they must be carefully adjusted and well made, with no parts that can develop any lost motion.

After the principle of construction is understood, there remain the various methods of installation and adjustment. The installation most generally used is shown in Fig. 2. Here the heater burns until the water is heated down to the thermostat, which then shuts the gas down to the by-pass flame. It leaves about a quarter of a tank for the by-pass flame to heat in addition to its keeping the tank warm through heat lost by radiation. The copper rod is in clean water where it can't obstruct the circulation.

Regarding loss of heat in the water due to radiation, this can be overcome to a very large degree by having the storage tank well covered with asbestos, cork, or other approved insulator of heat.

Where a high tapped boiler is used, either connection shown in Fig. 3 or Fig. 4 can be used. In Fig. 3 the entire tank is heated before the thermo operates, and this is desirable where large quantities of hot water are used. The only objection is that in bad water districts it will help to clog the circulation.

In Fig. 4 the thermo is shown connected on the line between the top of the heater and the tank. This is the most practical installation where it is desired to heat water at a predetermined temperature. For instance, the heater burner is set by the thermo to throw enough gas to heat the water to 120 degrees. As soon as the heater starts to circulate at a higher degree it throws the thermo off, also when it does not heat to 120 it throws the gas on. This regulates the burner to deliver water into the tank at the temperature desired. When the entire tank is heated the burner is shut down to the by-pass.



The question may be asked why in installing Fig. 2 it is not easy to set the thermo to throw off at a predetermined temperature. This is because the thermo has no control of the temperature going into the tank directly off the heater. It is affected only by the temeprature of the water into which it is placed, and while the water in the top of the tank may be hotter than that at the bottom, the thermostat is not in a position to control the entire tank. It operates only by temperature of the water into which the copper tube is inserted. Of course it can be set to control the amount of gas going into the heater, yet it is difficult to set it at a certain temperature and keep the entire tank at this temperature, mainly on account of fluctuation in gas pressure. Fig. 5 shows a proper installation on a horizontal tank.

The entire success of a thermostat, even though properly installed, depends upon the adjustment. It must be remembered that a thermostat is a double gas valve, or rather two valves in one. While both deliver gas to the burner through the same gas pipe, nevertheless in operation it is two valves. There is the valve that acts as the by-pass or pilot and keeps a supply of gas to the burner all the time. This pilot also keeps the tank warm, making up for the heat lost through radiation. This valve is not affected by temperature changes. The other valve supplies the burner with gas when the water at the thermo is cool. This valve is the one affected by temperature changes, and it is the regulation of this valve that determines the temperature of the water in the tank.

In regulating a thermo it is best to regulate the by-pass or pilot first. This is best done by first closing the other valve. The by pass should be just large enough not to blow out, or go out through a fluctuation of gas pressure. It must not be too large so as to overheat the tank, thus resulting in a big consumption of gas.

In adjusting the main valve it should be opened so that the burner does not quite burn at its maximum capacity. When one realizes that the valve operates at just a few thousandths part of an inch expansion or contraction, one can understand why care should be taken not to open it too far. The further this valve is opened the higher degree of temperature it will take to shut off the gas.

Occasionally a consumer will object to a by-pass which keeps a flame over entire burner on the ground that it consumes too much gas. The fact is, very

Continued on page 32

Victory Bonds buy bullets for the rifle some son is using; give him a chance to use his rifle well.

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ESSENTIALS AND NON-ESSENTIALS

WE have been asked by many of our readers, "Why are you advocating that the sanitary and heating trade build up a bigger business, etc., in SANITARY ENGINEER when you know that there is a shortage of labor, a shortage of material, that every atom that goes with a job of plumbing and heating costs so much more, etc., etc.?"

Our answer is this, and we feel sure that our readers will agree with us. In the first place, the Canadian government is taking care of the needs for munitions and the big wages paid to munition workers takes care of the labor problem. Next, the military department is not allowing men who should be fighting at the front to shirk their duty.

The question is, are we to slow down to such a point as to create conditions in our towns and cities which will result in insanitary homes and buildings? Is it not assisting the country if, say, large residences are re-modelled, thus housing two families instead of one; or installing sanitary appliances where none existed, but should have existed before the war?

Is this kind of work not essential? Is it not essential to have sanitary arrangements erected in our munition plants and factories where war work is being carried on, where in almost every factory and workshop there are 50 per cent. more people working at full steam ahead?

We believe that no matter what the work may be if it is not essential from every angle it should not be executed during war time, but we do not advocate that factories shall become insanitary. Neither do we believe that cheaply constructed outfits that will be a total loss after the war should be erected.

Here is another argument in favor of bigger business, but remember, not at the expense of properly conducting the war. There are thousands of working people who before the war were finding it hard work to pay for their little homes. These men could not afford to instal plumbing fixtures and as soon as wages went up a lot of them were never approached to put in plumbing, while others were, and did. The results are that those who were advised to instal plumbing are much more healthy, are living much more comfortably and are more efficient in their daily accomplishments.

That is why we believe that the sanitary and heating trade is an essential to the welfare of a community.

Readers of SANITARY ENGINEER will not know that our Bigger Business Building articles of which two have appeared have been discontinued. Why? Because SANITARY ENGINEER does not want its readers to have the impression that no matter what condition the country is in they should fight for business. That is not what we desire our readers to do. But what we do feel should be done is this:—

We should read all manner of articles, and write all manner of articles that, if absorbed to the full will be of great assistance when that period of readjustment comes, and come it must.

We also believe that there are lots of specialties that can be sold by our readers, which, if sold and installed, would be a patriotic duty performed.

Take for example, heat controlling devices. The fuel consumer who thinks that by careful firing he can save fuel is absolutely wrong. He may in days gone by have been told that his heating system is A1 and of the best type, but it is like a team without reins. It is not under proper control. Therefore, we would strongly advise a selling campaign on heat controlling devices. They save fuel, only weigh a few pounds in raw material, but save tons of coal.

Again, that leaking closet tank. A new closet combination installed where an old one now is may result in saving easily $25.00 worth of water, which is being wasted, which means motive power of some kind. Our munition plants have been put to a great deal of inconvenience all over Canada because of a shortage of power. And we would be safe in saying that if in Toronto and Montreal alone no leaking water closets were in existence thousands upon thousands of electrical horse power would have been saved.

Every Sanitary and Heating Engineer in Canada should buy some of these Victory Bonds.

Reasons for Failure of Heating Systems

Poor Building Construction Chiefly Responsible For a Large Per Cent. of Heat Loss—Heating Engineers Take Too Great a Risk in Trying to Heat Buildings Not Fit to Live in More Than Nine Months of the Year

By J. D. Hoffman, Lafayette, Ind., member of American Society of Heating and Ventilating Engineers.

So far I have been pleading for better exterior construction since this is the most vital. The points touched upon do not by any manner of means exhaust that part of the subject, but now notice what the heating man encounters in the interior construction, with indirect heating, or say furnace heating. (Steam and hot water direct heating may, of course, be fitted to almost any building no matter what the interior construction may be.) Of the unsatisfactory furnace systems, I wager that 75 per cent. fail because the architect and constructor have restricted the heating man to such a degree that the heat lines of his system are too small to carry the heat necessary to supply the loss through the outside walls and windows. If this statement is even only approximately true, then it would seem that our Society has neglected the furnace heating business. Any one of the necessities of the home that is so vital to so many of our people should be more carefully guarded.

Some furnaces fail to give satisfaction when installed in well built houses. Such plants are largely the mistakes of the heating man in not installing furnaces of sufficient capacity to do the work, or in not requiring certain changes in the house arrangements. In this, he should be held responsible. Too many furnace men are willing to risk too much. They should know what will or will not work, and should stay by their convictions or throw over the job. The man who is not willing to sacrifice his reputation for the sake of a job that he feels sure will fail, or one that he would have to "skin" in order to make a living wage will always carry a reputation for safe and sane work. However, by far the greater number of plants fail because of limitations imposed upon the furnace man by features of building construction in no wise under his control.

To note some of these limitations, taking them in the order of first importance, the wall stack is, in my opinion, the chief offender. In houses of this classification ($5,000 or less) the interior walls are built of 4 in. studding, set 16 in. on centers. This gives, allowing for shrinkage of the studs, approximately 3¾ by 14¼ in. maximum cross section of opening through which the vertical air ducts (stacks) are run. Since stacks fit loosely in this space and are supposed to be insulated from the wood work of the wall by one or two layers of asbestos paper, single walled stacks will be about 3⅝ by 14 in. and double walled stacks (two stacks fastened symmetrically with each other with a thin air space between), 3¼ by 13⅝in. All such stacks are of tin or light galvanized iron, and as such cause very little friction in the movement of air through them, but they fail because they are too thin or because they have too many right angled turns. The maximum wall stack has say 45 sq. in. net cross sectional area. This will supply a 10 x 12 ft. centrally located room having small exposure, but is not sufficient for large rooms or for heavily exposed rooms.

EDITOR'S NOTE.

It is just such articles that should convince every heating engineer on this continent that there should be some practical form of heating by-law in operation in every province. In fact, such an ordinance should come under the mechanical or engineering section of a Federal Health Department. The problem is not only one which involves a saving of fuel, but also proper heating and ventilating of buildings, the latter being purely and simply a health matter.

The article also contains some splendid selling talks which if thoroughly taken to heart can be used to good advantage when advice is being given by the average heating engineer to his customer.

Strange as it may seem, some of the best illustrations of how not to do this part of the work are furnished by buildings where one would have every reason to expect to find the best. This winter I was called to look over a furnace system recently installed in one of the better class residences where two adjoining corner rooms on the second floor, southeast and southwest, approximately 12 x 16 x 8 ft. each, supplied from one wall stack of 14 sq. in. net area. This stack topped by one register in each room, was supposed to keep the rooms comfortable. As a matter of fact this stack would not supply one room of the size stated, even if the room were better located than either one of these was, but this feature was not the worst. The stack as installed had a horizontal offset in the second floor of about 2 ft. and to add to this, it was located about as far from the furnace center as could be done without actually putting it in the outside wall. The first floor plan would have permitted a stack to each room and shorter leaders, hence the fault was largely on the furnace man. What he should have done was to insist upon a 6 in. partition, or still better an 8 x 8 in. stack to each room from a point near the furnace, which could have been done by slightly modifying the first floor wall construction.

The whole installation is the best illustration of how not to do it that I have seen for a long time and is typical of a large group of others. There are so many heating plants resembling this one that it is no wonder the suffering public is beginning to condemn the whole furnace business. The ordinary wall stack is a habit with us and a very bad habit. Can't we conceive of some new styles of first floor designs that will permit square, or nearly square, air shafts instead of the elongated rectangle whose effective cross area approaches zero? I am no architect but in many cases have been able to suggest changes that caused little loss in appearance and gained the point desired in heating.

Another point, chargeable principally to the owner, is the low basement ceiling that reduces the pitch of the leaders to a minimum. If the average householder realized the importance of extra pitch to the pipes in the basement, he would let loose of enough additional eapital to guarantee a ceiling height of 8 ft. instead of 6 ft. as is so often found.

Another point tabooed by the average furnace man as unnecessary, is the return metal duct. No furnace plant should be installed that has any part of its air lines formed by merely tinning along the edges of the studs and joists. This is against the laws of the convection of air and is an offense against the sanitation of the building. The almost universal custom among furnace men is to take air from off the floor of the room, together with dust and all, and carry it back to the basement through a duct that has one side of very rough plaster, two ends of rough studs and one side of tin. In many cases this is continued to the furnace between rough joists on two sides, a fairly loose floor above and tin beneath. After a while the collection of dusts and microorganisms that deposit on these rough surfaces would fill a cemetery if turned loose en masse on the neighborhood. Why not add a few dollars to the building and make a smooth duct system with hand holes at intervals to permit cleaning once a year by swabs or fans as the case may require. Not only will the house be more sanitary but the heating system will come nearer giving satisfaction because the laws of friction have been considered intelligently. Teach the householders what to expect and most of them follow your advice.

It's the only way, if we want to keep our money at home and want hard enough.

All furnace plants operate on the principle of natural air circulation, i.e., when air is heated it expands, becomes lighter and rises, while the surrounding cold air falls and takes the place formerly occupied by the heated air. This is plainly experienced when standing by a large bonfire. The heat of combustion causes strong up-currents above the fire and corresponding cross-currents of cold air along the ground toward the fire. Consequently, when air within the furnace is heated there is an unbalancing of the densities (weights) between the air within and that without the furnace, resulting in the warm air rising from the furnace to the house rooms through connecting pipes and the cold air from the rooms falling and entering the bottom of the furnace in an attempt to preserve the balance.

Combustion, therefore, within the furnace fire box produces continuous circulation of the air. Now the two chief obstacles in the way of a satisfactory circulation are the pitch of the pipes and the friction of the air current as it moves through the pipes to the room. Warm air must travel upwards to the rooms; consequently leader pipes that lift above the horizontal benefit circulation in proportion as that lift approaches a vertical. The circulating effect of a horizontal pipe is nil—that of a vertical pipe, 100 per cent. The pitch of the pipes, therefore, should be made as great as possible. This means that the basement should have a high ceiling, the furnace should be set low (sometimes in a cemented pit) and the leaders should be short. These conditions may be hard to obtain, but they sholud be met as nearly as possible. A furnace set in a low ceiling basement, with leaders long and fairly near the horizontal may be labeled "failure" even before it is fired up.

The conditions governing the pitch of the pipes, aggravating as they may be, are to a greater or less degree within the control of the heating man. Friction, on the other hand is a worse enemy to overcome because the conditions controlling it are bound up with the house wall construction and this is usually fixed by the architect before the problem is put up to the heating man. I have no desire to shift the burden of responsibilitw. The mediocre heating man, especially the furnace man who knows enough to buy a furnace at the cheapest price but does not know enough to install it correctly, is a detriment to the heating profession, but in many cases he is more sinned against than a sinner. He is the victim of a type of construction that even the best at times stumble over. What we need in this country is a type of building construction that looks toward comfort, utility and permanency.

Is it not possible to develop a campaign of education in such a way that the average man who may be contemplating building himself a little home may become more informed on these vital points that are so necessary in coordinating the heating and ventilating features with the building construction, and in that way develop an independent thinker who will not be wholly at the mercy of the unscrupulous promoter or the uninformed individual who frequently poses as an architect or engineer? Such a movement to be effective must be supported by some organization of men whose interest in the best things under discussion cannot be questioned. The press of the country is always ready to assist in anything that tands for the public good so long as it is convinced that the movement is bona fide and under competent supervision. May the time soon come when we will build our houses to serve as homes and not as private cantonments.

WHAT IS THRIFT?

Before you can practice a virtue you must know what it is. When we speak of thrifty people we are apt to picture them living on cheap food, in cheap quarters, wearing shabby clothes, having little or no pleasures, and saving every cent possible. But that is not thrift—far from it. Thrift is a greater virtue than the mere saving of money. Don't forget that.

The prudent man looks ahead and gets ready. The frugal man lives carefully and saves persistently. The economical man spends judiciously, buys wisely and wastes nothing. The industrious man works hard and saves hard; the miser hoards; but the man of thrift earns largely, spends wisely, plans carefully, manages economically and saves consistently. Thrift is all of prudence, economy, frugality and industry—and "then some." Thrift is that instinct of the dog that buries the bone he doesn't want for to-morrow's wants; the instinct of the squirrel that knows nutting is out of season in winter.—W. K. Kniffur, Jr.

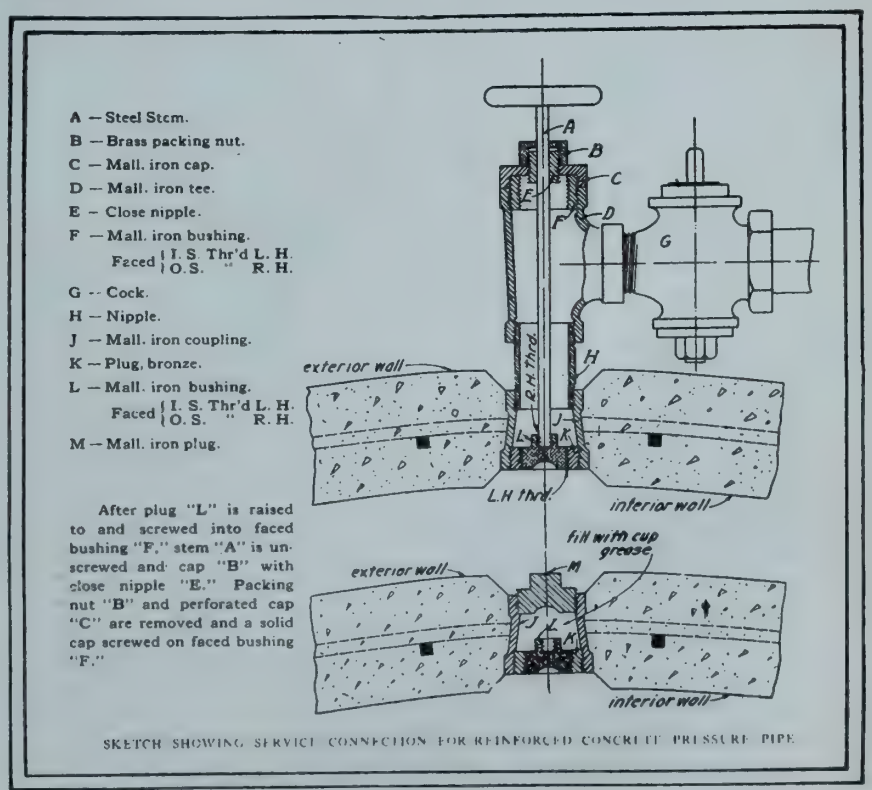
POWDERED COAL AS A FUEL—A NEW BOOK

"Powdered Coal as a Fuel," by C. F. Herington, is the subject of a new book recently issued featuring various types of powdered coal plants. While it is true that the number of such plants operating in this country is small it is pointed out that many of these plants have been in operation ten to fifteen years, during which time they have demonstrated their efficiency. The fuel to be used should be bituminous or semi-bituminous, either slack or run-of-mine. Coals rich in volatile matter are preferred. The following chapter heads will give some idea of the scope of the text: Coals suitable for powdering; preparation of powdered coal; feeding and burning powdered coal; powdered coal in the cement industry; application of powdered coal in metallurgical furnaces; powdered coal under boilers; powdered coal for locomotives; explosions— storage difficulties. The book contains 84 illustrations and more than 200 pages. It is published by D. Van Nostrand Co., 25 Park Place, New York, and sells for $3.00 net.

It is not being out at heels that makes a man discontented, it is being out at heart.—Bliss Carman.

The best compensation for doing things is the ability to do more.—Ginger.

Too low they build who build beneath the stars.—Dr. Young.



SKETCH SHOWING SERVICE CONNECTION FOR REINFORCED CONCRETE PRESSURE PIPE

Say, Mr. Reader, have you cleaned up your scrap recently?

PRACTICAL SHEET-METAL WORK

THREE PIECE ELBOW WITH GUSSET OR GORE PIECE.

BY THOMAS STANFIELD

THE problem described in plate 30 is that of a roof hopper, for a flat or deck roof.

This type is the most popular, for the reason that it will not block up even when a thick layer of snow falls on the roof. The holes in the strainer piece are necessary to allow the warm air to penetrate through the snow.

Then the holes at the lower end prevent any large obstructions from getting into the rain water leaders. This strainer piece can be removed as it should be made separately. Fig. A shows how such a hopper is installed when completed.

Fig B. shows the flat flange piece. The hole in centre should be turned or beaten down so as to enable it being riveted to the body Fig. C.

First draw a plan and elevation as shown in Fig. D, divide the half plan into equal number of parts 1, 2, 3, 4, 5, 6, 7, 8, 9.

Fig. F shows how the pattern for strainer piece should be developed as well as method of laying out holes in strainer.

Draw line a, b, which is centre of strainer plan. Place compasses at b and open up to c. Next draw an arc d, e. Then transfer the measurements from half plan Fig. D twice as shown, this gives the total length of sheet metal and shape required for strainer. From these points the holes may be laid out, allow for seam which need not be soldered, this completes the pattern for strainer except that the lower portion at f.g. should be beaten out square and a collar riveted on, this may be of any length required according to diameter of hopper. It is good practice to make these collars the same length as diameter.

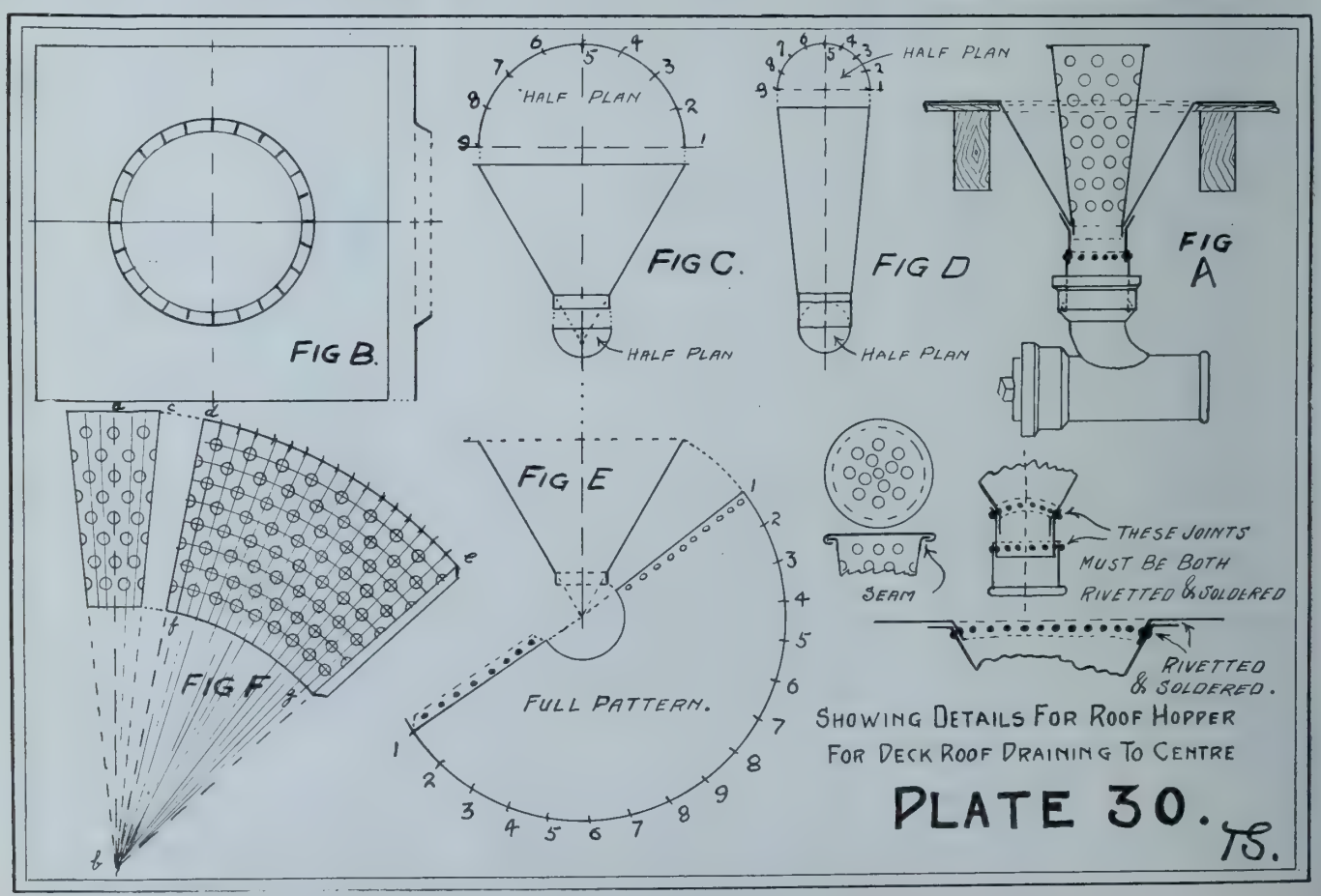
Now draw a plan of body as shown in Fig. C, in following the same method as described in Fig. F. except of course that this piece should be both seamed and riveted as well as soldered. Fig. E shows the full pattern for this piece.

The small sections shown to the right describe the best way to make the various joints. It will also be noted that the brass ferrule is riveted as well as soldered.

The gauge of material should never be less than 20, if galvanized iron is used, and whenever the acid is used in soldering, it should be tinned, for the reason that where the galvanizing is burned off with the acid, it is liable to rust easily.

Some sheet metal workers use ash-

(Continued on page 25.)



New Canadian Patents

No. 183,952.

Horace C. Nixon, Saskatoon, Sask., 30th April, 1918. Filed 12th August, 1915. Receipt No. 196,898.

Claim: A cleanout comprising a spigot exteriorly threaded within a short distance of the top, the unthreaded portion being convergingly tapered, a cap for said spigot interiorly threaded and having a tapered groove of smaller cross section than the tapered wall of the spigot, whereby the walls of the groove bear on the wall of the spigot on both the inside and outside and form a sealed chamber for lubricant in said cap, substantially as described and shown in the drawings.

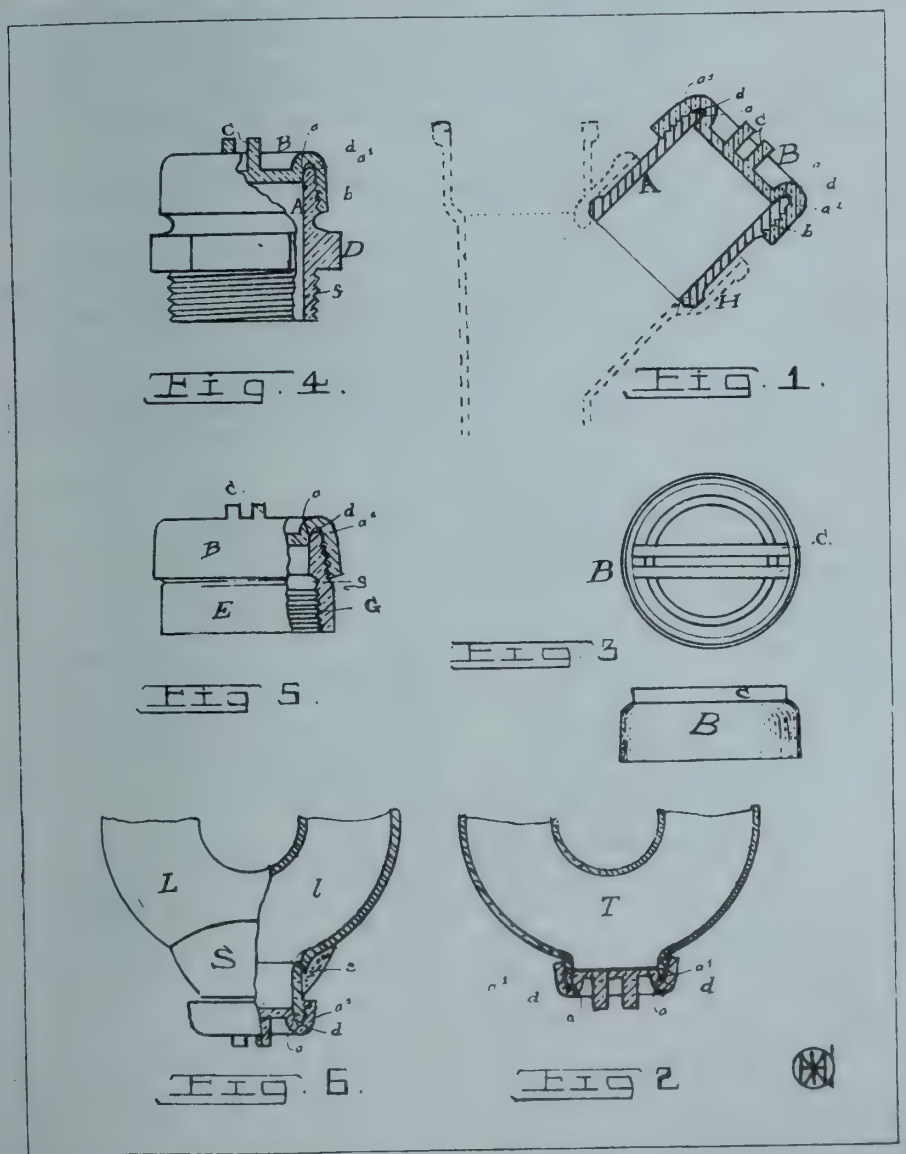
The Speci. shows:—The spigot A for caulking into hub of pipe or fitting, with portion b near top exteriorly threaded, thus protecting the threads from the action of sewage gases, which action destroys the metals by galvanic action.

The cap B is interiorly threaded in conformity with the threaded portion b of spigot.

The unthreaded portion at the top of the spigot is convergingly tapered and by the closing operation of the threads of the cleanout is sufficiently forced into a tapered groove of smaller cross section, formed in the cap, to bear closely on both the inside and outside, thus forming two distinct metallic seals a and a^1. A minute air-tight annular chamber or duct d is thus formed, the insertion in which of a small amount of grease and graphite will render the opening and re-assembling of the cleanout after any lapse of time both easy and certain, without damage, by the engagement of any piece of rod or bar, such as a poker, with the transverse strengthening bars, cast on, to rotate the cap.

The spigot of the cleanout can be also formed in brass, gunmetal or other suitable metal, either threaded externally as at f in Fig. 4, or internally as at g in Fig. 5, for durham work, or with plain tail for piping onto lead pipes or traps as shown in Fig. 6.

The method of affixing to drawn brass traps is by flaring out the aperture to to form shown and threading as required. The spigot can be cast on the cast brass ones at the time of manufacture.



BOOK ENTITLED "GAS FROM STRAW"

By Prof. R. D. McLaurin, Saskatchewan University. In the Northwest where coal is very high and straw is very plentiful it has been found practicable to use the latter for gas manufacture in small plant units. The retorts are made from highly refined steel and designed for individual use on the farm. They are enclosed in a metal or fire brick casing with a fire box below. With scrubber and gas holder the total cost is about $500. The straw is compressed into bales the shape of the retort. About 30 per cent. of the total gas produced is used for heating the retorts. All the gas can be removed in about 45 minutes. There is a surplus of about 7000 cubic feet per ton of straw carbonized. The heating value is about 400 B. t. u. per cubic foot. Every ton of straw produces 6 to 8 gallons of tar and ammonia liquor. The carbon residue (about 600 pounds per ton of straw) finds application as lamp black. The gas consists of methane, hydrogen and carbon monoxide. It has a slight odor and is quite suitable for mantle lamps, stoves, grates and furnaces.

PRACTICAL SHEET METAL WORK

(Continued from page 24.)

phaltum on these hoppers as an extra precaution. Where possible the use of copper is very much preferable and when copper is used care should be taken not to beat, or turn over the seams too sharp. Soldering all joints is far better than too tight a locked seam.

It will be noted in Fig. A that a cast iron T. Y. and cleanont is shown, this is merely fitted to the hopper so as to give the reader an idea how a hopper may be installed when there is a horizontal rim of piping, in which case the pipe should always be cast iron.

(Continued in Next Issue.)

Market Conditions and Tendencies

Statements Regarding the Prices and Trend of Supplies.

THE MARKETS AT A GLANCE

DECLINES have featured the markets since last issue. These are apparent in the lower prices prevailing on tin with a resultant drop in prices of solder. The tin market is now generally below the dollar mark, with supplies very fair and no definite action on price-fixing as yet announced. The lower-priced tin has resulted in a reduction in quotations on solder, amounting to from three to five cents per pound.

Lead, however, is a very scarce metal. Practically all available supplies are now being absorbed in the prosecution of essential war work, and this provides a very firm undertone to the market on the manufactured lead products, such as traps, bends, etc.

Another dollar has been added to quotations on galvanized sheets in some quarters. There have been some small arrivals, but the situation generally shows little improvement as yet. However, there are indications that the question of supplies may improve, some jobbers reporting that shipments now rolling will help out materially in both black and galvanized.

An advance of 1c per pound in wiper's waste has occurred. A "government standard" wool waste is now on the books, and will be the only grade turned out by the manufacturers; it will contain 40 per cent. cotton thread, or at any rate, not more than 60 per cent. wool.

Soil pipe is holding firm at recent advances, and the question of supplies is still one of uncertainty. A readjustment of prices on smallest type of enamel basins has been effected, resulting in lower levels for this one size. Enamelware as a whole rules very strong, and any general change will be in an upward direction.

TRONTO, October 12.—A decline in tin and a resultant decline in prices of solder has featured the markets since last issue. Higher prices have been named on galvanized sheets also and wipers' waste is up about 1c per pound. Soil pipe is firmly held and the market on valves is ruling with a very firm undertone.

Market Steady On Range Boilers

RANGE BOILERS.—The market is steady and the question of securing the material to manufacture these is a serious one. So far the trade has been pretty well taken care of on the best selling sizes. Prices are unchanged as follows:

	Standard	Extra Heavy
30-gallon range boilers	$14.00	$17.00
35-gallon	17.00	20.50
40-gallon	20.50	24.00
52-gallon	28.00	32.00
66-gallon	37.00	42.00
82-gallon	45.00	50.00
100-gallon	62.00	70.00

Readjustment of Basin Prices Made

ENAMELWARE.—The market rules with a firm undertone and supplies are none too plentiful. Any change made will be in an upward direction it is thought. A revision in prices on the smallest type enamel basins is reported, the flat back, 15 by 15 inch, now being quoted at $6.00 each, a decline from $7.20 and the corner basin, 15 inch, $5.95, the former price being $7.15.

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Basins, flat back, 14 x 15 in.	6 00
Do., corner, 15 in.	5 95
Sinks, roll rim, 18 x 30 in., staple	16 80
Closets, oak tank and seat	25 00
Do., enamel iron or white vitro tank	27 00

Firm Market in Soil Pipe, Fittings

SOIL PIPE, FITTINGS.—The market on all soil pipe and fittings rules with a firm undertone. No further change in soil pipe over prices shown in last issue has been made but the scarcity of raw materials is still a factor of strength in the situation. The output is limited and taking supplies wanted into stock now would seem a wise precaution.

SOIL PIPE AND FITTINGS

Medium and extra heavy soil pipe, 2 in. to 6 in.	15%
Medium and extra heavy fittings, 2 in. to 6 in.	25%
8in. soil pipe and fittings	Net list

C. I. PIPE FITTINGS.

Cast iron fittings	Net List
Plugs	15%
Bushings	18%
Flange unions, standard	Net List
Dart unions, ¼-inch to 2-inch	15%
Do., 2½ in. and larger	6½%
Nipples, up to 4-inch	45%
Do., 4½-inch and larger	40%
Do., running thread 4-in. and under	25%
Couplings, 4-in. and under	35%
Do., 4½ in. and larger	15%

MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittgs., Class A, lb.	.60	.75
Do., Class B., lb. net	.27	.37
Do., Class C., lb. net	.19	.27

Valves Show No Change; Firm

VALVES.—Scarcityof supplies is still a factor in the outlook. The market is strong though no change over previous prices is noted. Tendencies point towards higher levels but how soon a change may be made is somewhat uncertain.

	Discount off list
Ground work	42
Compression work, standard	47
High grade	41
Cushion work	40
Fuller work, standard	45
High grade	38
Basin cocks, No. 0 standard	40
Nos. 1 and 2	40
Bath cocks	50
Flatway stop and waste cock, standard	50
High grade	47
Roundway stop and waste cocks, standard	50
High grade	47
Brass steam cocks, standard add 10%.	
Globe, angle and check valves, standard.	Net
Do., removable seat	Add 5%
Radiator valves, standard	10
Do., removable seat	Net List
Patent quick opening valves	30
Basin Cocks—	
No. 0 and 1, Fuller pattern	45
Globe, angle and check valves, standard, medium pressure	20
Radiator valves, standard med. pressure.	30
Radiator valves, removable seat, medium pressure	25

Wipers Up 1c lb.; Wool Waste Restricted

WASTE, OAKUM.—Wipers show an advance of 1c per pound in prices now being issued to the trade, while other lines of waste remain unchanged. However there are already indications that

Some time ago a reader told SANITARY ENGINEER that he picked up over $500 worth of old material.

higher levels generally must prevail on cotton waste and definite action is being taken by some manufacturers in this respect, which will mean new prices by December 1, on expiration of present contracts. The question of securing supplies is uncertain, and one firm intimated that owing to impossibility of securing colored thread they were compelled to complete some of their contracts for colored waste with white thread waste, which means a decided loss. It is further intimated now that a government standard wool waste has been developed. There will in future be only one grade, manufacturers being compelled to put in 40 per cent. cotton thread, allowing a maximum of only 60 per cent. wool.

Oakum is firm and unchanged with the demand continuing along satisfactory lines. Prices prevailing are as follows:

	Per 100 lbs.
Best American	$21 00-$22 00
Clipper, spun	- 21 00
Do., unspun	- 10 50
Plumbers', spun	10 00- 10 50

Wrot. Pipe Very Firm; Supplies Light

WROUGHT PIPE.—There is little change in the situation in respect to wrought pipe. It is increasingly hard to secure the raw material and there seems no likelihood of improvement for some time to come. No further change in prices has been made over recent advance as provided for in quotations shown in panel herewith:

WROUGHT IRON.
Price List No. 37—September 11, 1918

Standard Buttweld

	Steel	Gen. Wrot. Iron
	Per 100 feet	
	Blk. / Gal.	Blk. / Gal.
⅛ in.	$ 6 00 / $ 8 00	$..... / $.....
¼ in.	5 22 / 7 35	5 52 / 7 65
⅜ in.	5 22 / 7 35	5 52 / 7 65
½ in.	6 63 / 8 20	7 06 / 8 71
¾ in.	8 40 / 10 52	8 97 / 11 09
1 in.	12 41 / 15 56	13 26 / 16 41
1¼ in.	16 79 / 21 05	17 94 / 22 20
1½ in.	20 08 / 25 16	21 45 / 26 54
2 in.	27 01 / 33 86	28 86 / 35 71
2½ in.	43 29 / 54 11	..... / .....
3 in.	56 51 / 70 76	..... / .....
3½ in.	71 76 / 88 78	..... / .....
4 in.	85 02 / 105 19	..... / .....

Standard Lapweld

	Steel	Gen. Wrot. Iron
	Blk. / Gal.	Blk. / Gal.
2 in.	$ 31 82 / $38 30	$33 70 / $40 20
2 ½in.	47 97 / 58 21	50 90 / 61 10
3 in.	62 73 / 76 12	66 66 / 79 90
3½ in.	78 20 / 96 14	82 80 / 100 00
4 in.	92 65 / 114 00	98 10 / 119 00
4½ iu.	112 00 / 137 00	125 00 / 149 00
5 in.	130 00 / 159 00	145 00 / 174 00
6 in.	169 00 / 206 00	188 00 / 226 00
7 in.	219 00 / 268 00	243 00 / 292 00
8L in.	230 00 / 281 00	255 00 / 306 00
8 in.	265 00 / 324 00	294 00 / 353 00
9 in.	317 00 / 388 00	..... / .....
10 L in.	294 00 / 360 00	326 00 / 392 00
10 in.	379 00 / 464 00	420 00 / 505 00

Terms 2% 30 days, approved credit.
Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

No Arrivals of Boiler Tubes Noted

BOILER TUBES.—There have been no recent arrivals reported, consequently boiler tubes are still a very scarce article. As far as can be learned there are no tubes on the way to this market and stocks are pretty well cleaned up. There are no changes in prices recorded which are as follows:

BOILER TUBES—	Cold Drawn	Lapweld
1 inch	$36 00	$.....
1¼ inch	40 00	.....
1½ inch	43 00	36 00
1¾ inch	43 00	36 00
2 inch	50 00	36 00
2¼ inch	53 00	38 50
2½ inch	55 00	42 00
3 inch	64 00	50 00
3¼ inch	.....	58 00
3½ inch	77 00	60 00
4 inch	90 00	75 00

Sheet Situation May Improve; Higher Prices

SHEETS, PLATES.—Indications are that stocks of both galvanized and black sheets will be augmented by arrivals during the next couple of weeks. However, firms entering the market for steel supplies are still finding that the going is poor. Last week a large concern in the east applied to the War Trade Board for supplies for the finishing of a plant where chemicals were to be manufactured, but the Ottawa authorities seemed to have it figured out that it would be some time before they could produce any of the finished article. Their application for material on the embargo list was refused.

Supplies in jobbers' hands are the lowest they have ever been. Galvanized are up $1.00 per 100 pounds, making basis on 10¾ oz. $12.00 with corresponding increase in other grades. Both 10¾ and 28 gauge are practically off the market locally and supplies of 12 gauge, 14 gauge and 16 gauge black sheets in some quarters are exhausted for the present. Houses that have light sheets, however, are selling them out in nearly every case around $12.50 to $12.75. and there is nothing to show that the top has been reached in the matter of prices. Perhaps the industries that are most affected are the stove makers, and the firms using much material for soil pipe, roofing, etc.

BLACK SHEETS—	Per 100 lbs.	
10 gauge	$.....	$10 00 / $.....
12 gauge	.....	9 60 / .....
14 gauge	.....	8 40 / 8 90
16 gauge	.....	8 50 / 8 55
18-20 gauge	8 05	8 30 / 8 80
22-24 gauge	8 10	8 35 / 8 85
26 gauge	8 15	8 40 / 8 90
28 gauge	.....	8 50 / 9 00
3-16 inch plate	.....	10 00 / .....
¼ inch boiler plate	.....	10 00 / .....

Prices shown are for full cases. An extra charge of from 25c to $1 per 100 lbs. is made for less than case lots.

GALVANIZED SHEETS—		
10¾ oz.	$11 00	$12 95
U.S. 28	10 70	12 50
U.S. 26	10 40	11 40
22 and 24	10 25	11 25
18 and 20	10 10	11 10
16	9 95	10 95
14	9 85	10 85

Prices shown are for full cases. An extra charge of from 25c to $1 per 100 lbs. is made for less than case lots.

Sharp Drop in Solder Recorded

LEAD AND ZINC PRODUCTS.—Revised prices are again in evidence since last issue, and new quotations provide for a sharp decline. Guaranteed is being sold at 50c to 55c per pound; strictly at 47c to 52c; commercial at 42c to 45c and wiping at 40½c to 50c. The easing away of the tin market is primarily responsible for this move.

The market on manufactured lead products is ruling with a firm undertone but prices are unchanged for the week. Scarcity of the metal is still in evidence and this may assume proportions which will bring about an advance in prices in the manufactured article. In the meantime, however, range of quotations is as follows:

Lead pipe, lb.	....	0 15
Lead waste pipe, lb.	....	0 16
Lead traps and bends	....	Net list
Lead wool, lb.	0 15½	0 16
Lead sheets, 3 to 3½ lbs. sq. ft., lb.	0 14½	0 15
Lead sheets, 4 to 8 lbs. sq. ft.	0 13½	0 14
Cut sheets, ¾c. lb. extra and cut sheets to size, 1c. lb. extra.		
Solder, guaranteed, lb.	0 50	0 55
Solder, strictly, lb.	0 47	0 52
Solder, commercial, lb.	0 42	0 45
Solder, wiping, lb.	0 40½	0 50
Solder, wire, lb.	0 55	0 70
Zinc sheets, per lb.	....	0 26

Scrap Materials Dull; Trade Stagnant

OLD MATERIALS.—The scrap metal trade is dull. Dealers are not buying heavily. In fact in some cases they are accepting shipments simply in order to protect their credit and keep in the market. Large volumes of scrap are disposed of direct from seller to consumer. Dealers fear that industries that cannot get into the iron market may cease buying scrap because they cannot get pig enough to complete the mixture. At any rate the trade is well nigh stagnant as far as big deals are concerned. There has been no change in prices, but a general revision to lower levels would not come as any great surprise.

Dealers' Buying Prices

Tea lead	$0 05¼	$....
Heavy lead pipe	....	0 08
Yellow brass	0 12	0 13
Red brass	....	0 21
Light brass	....	0 09½
Heavy zinc	0 05½	0 06
Heavy copper	0 22	0 23
Stove plate, per ton	....	25 00
Old cast iron, per ton	....	30 00

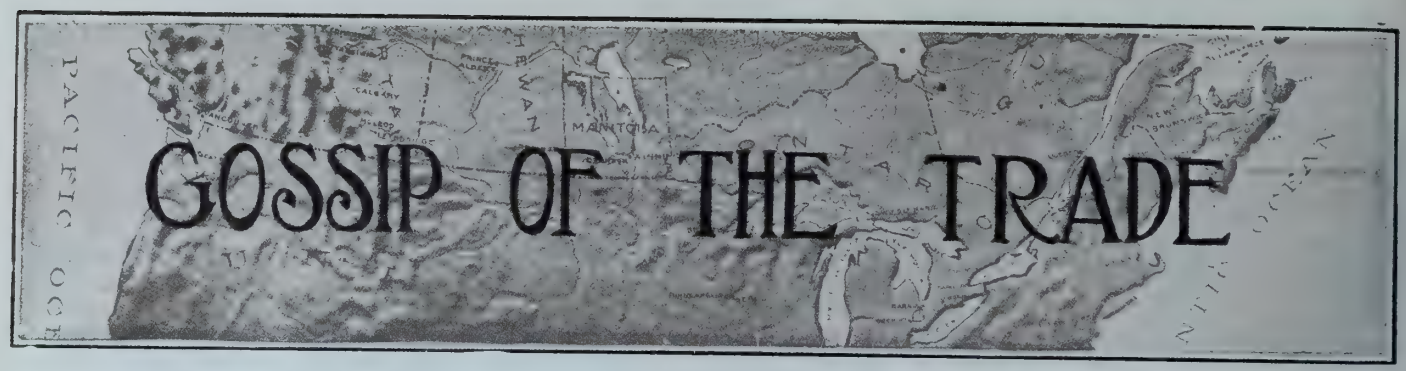
Tin Goes Lower; Lead Scarce

INGOT METALS.—Quotations on tin show a further easing away and supplies generally are sufficient for the demand. Supplies of lead are being used exclusively for war work, and even at that it is difficult to take care of the demand. Spelter is quiet and there is little interest in antimony. As a whole the market is rather quiet.

COPPER.—Production as attained by the various producers is still no more than ample to take care of the government requirements. It is understood that no war industry is suffering, but there is nothing left for civilian requirements. Prices locally are unchanged at 30-32 cents per pound.

Continued on page 29

and never missed the old stuff from his stock. Old valves, old brass fittings, etc., will help buy new Victory Bonds.



WOUNDED AT THE FRONT

The friends of Clarence R. Paddon will regret to learn that he has been wounded in action and is now confined in one of the military hospitals "Somewhere in France." He hopes, however, "to get another whack at the Kaiser's minions" before the war is over. In spite of the suffering, etc., he writes: "When I got hit I crawled into a shell hole, where I dressed my wound as best I could, took off my equipment and finished off some bread and jam I had with me, then waited for things to quieten down a little, for, believe me, it was lively around there for a while and Jerry was dropping 5.9's all around the shell hole, one even landed where I fell, but a miss is as good as a mile."

I might say that this is more like living again down here. A good bed, nice nurses, good things to eat, a phonograph, a canary and a parrot. Who wouldn't get wounded? It was lucky that I was not killed on the spot."

"It is just such pluck and courage that is making the Canadian boys felt, and no amount of "comfys" are too much for them after the battles which they are all going through.

We sincerely hope that Pte. C. R. Paddon will soon recover from his wounds, get his whack at the Kaiser's men and return safe and sound. Such boys, while very necessary at the firing line, are doubly necessary at home, so that their pluck and courage may be devoted to the building up of Canadian industries.

DOWN WITH THE "FLU."

Among the scores of members of the sanitary and heating trade who have been affected with the Spanish influenza are A. H. Read and his son, of 692 Shaw street, Toronto. It is to be hoped that this scourge will soon be a thing of the past and that fatalities amongst the members of the craft will be few or none.

COAL FOR BY-PRODUCT GAS PLANTS

More men are going to France every week. More explosives are needed for our forces abroad every day. It is vitally essential that the gas plants, which already are recovering toluol, and those building or contemplated, be insured the best quality of gas coal to the full extent of their requirements. There should be no red tape, delays or other embarrassments experienced by such plants in getting a steady supply of all the good coal they need. They should be given preferential orders of the broadest type if they are to function fully and correctly. So far as we have been able to learn, this has not yet been done.



PTE CLARENCE R. PADDON, WINDSOR.

Reported wounded while in action in France.

ADDRESSED TO THE AMERICAN SOCIETY OF SANITARY ENGINEERS

The editor of SANITARY ENGINEER gave an address on Monday, October 14, before the members of the American Society of Sanitary Engineers at their 13th annual convention, held in Chicago, the subject of the address being, "The Main House Trap." Quite a number of the members present took part in the discussion. A report of this interesting convention will appear in the November 1 issue of SANITARY ENGINEER.

NO CAST IRON SOIL PIPE BELOW GROUND

A number of regulations were adopted at a meeting of the building material section of the U. S. Industrial War Board of which Richard L. Humphrey is the chief, along with representatives of the army and navy, the United States Housing Corporation, the supervising architect's office of the Treasury Department and other departments were represented.

The following regulations as authorized by B. M. Baruch, chairman of the War Industries Board, will be particularly interesting to sanitary engineers.

New regulations governing the use of cast iron pipes, tanks and accessories

The Duty of the Hour

IT is imperative that Canada's 1918 Victory Loan should be well over-subscribed and even more successful than last year's. Firstly, because we cannot continue to do our part in the war without the required funds; secondly because we cannot obtain those funds unless the national activities are maintained at high pressure; and thirdly because that end cannot be accomplished unless we finance the national activities which have such a vital bearing on the international situation and the conclusion of the war.

It cannot be emphasized too frequently that the safety of our national structure and our participation in the war, depend entirely upon the results of the 1918 Victory Loan.

Our prosperity during the past year was a direct result of the response to the Loan issued last fall. The continuance of our prosperity during the coming year will depend upon the degree of success achieved by the Victory Loan of 1918. Common foresight makes it imperative that everyone should buy Victory Bonds.

to be placed in government projects under way and under consideration.

Nothing larger than 4-inch diameter, nor heavier than standard plain cast iron soil pipe is to be used for vertical stacks above ground; the full size stack to be carried through the roof.

Portland cement concrete or vitrified clay pipe shall be used for horizontal lines underground.

No metal pipes shall be used for water mains without special permission of the War Industries Board. This does not apply to pipe lines carrying a pressure of more than 100 pounds.

All water-supply tanks shall be of other material than metal.

MARKET CONDITIONS AND TENDENCIES

Continued from page 27

TIN.—The basis of quotations prevailing locally, 95c to $1.00 per pound, represents a decline. This is now general and it is indicated that supplies are sufficient for the demand of the trade.

SPELTER.—The price is holding at an unchanged level of 11c per pound, and there is no particular item of interest pertaining to this market. Supplies are equal to requirements which are within rather limited amounts.

LEAD.—Reports from primary points indicate that producers are hard put to speed up with the war requirements. This is bound to be reflected in the requirements for commercial purposes, but there has been no particular desire to boost prices. Locally supplies are fair, and quotations hold at 10½ to 11 cents per pound.

ALUMINUM.—The use of aluminum is confined practically altogether to government account. When this demand has been met there is little left for domestic consumption, so quotations may be said to be only nominal at 50c per pound.

ANTIMONY.—The market is quiet and featureless. Supplies are very fair and the demand limited. The price is unchanged locally at 18c per pound.

WINNIPEG PLUMBING DIVISION

Permits Issued

103

Inspections

Water Tests	Smoke Tests	Subsequent Inspections	Miscellaneous Inspections	Defects Rectified
69	88	302	22	157

Sewer Division

Permits issued	Connections constructed	Inspections
15	13	47

Sewer Maintenance Division

Tank Flushings Gallons	Hose Flushings Gallons	Total Gallons of Water
920,576	714,375	1,634,951

The above table shows the work accomplished by the Winnipeg Plumbing and Sewer Inspection Department during the month of September—a public service that cannot but be of inestimable value to the citizens of Winnipeg.

PIG IRON.—Every effort to speed production of pig iron is being made and as production seems to increase so do the war requirements. This means that the amount released for commercial purposes is very small and is, it is indicated, becoming a negligible factor.

TWO HUNDRED FAMILIES SUFFER AS RESULT OF RUSTING OF UNDERGROUND PIPES.

Over two hundred families in the Toronto Housing Company's apartment scheme on Bain avenue have been without heat for a considerable time and some of the occupants have threatened to call in the medical health authorities if remedy is not quickly provided.

Steam pipes running underground have rusted through and consequently the heating plant is out of commission. Earlier in the fall it was off for a week, but occupants of the apartments hoped for repairs and kept warm by means of gas ovens and small stoves, etc. Commenting on the above, it is just such conditions as are prevailing and referred to above which prove the force of the arguments used by SANITARY ENGINEER, when we maintain that heating of our homes and buildings should be under the jurisdiction of our Health Department.

We do not, however, advocate that a medical officer of health should be saddled with matters mechanical, but that he should have two departments, viz:—Medical and Mechanical, the latter to work in conjunction with the former. For example, when those underground pipes were first laid, apparently very poor provision must have been made to prevent corrosion and only a far sighted engineer whose sole aim would be to safeguard the health of the people would have foreseen probable trouble, and unhealthy conditions resulting, if piping so laid was not properly protected against corrosion. Not only so, but there should be laws in force that would not allow pipes to be laid for such a purpose that are not installed in water and moisture-proof tunnels.

An Appetite's A Bad Thing Now

THIS cost of living is a thing what causes me to fret—I'm worried in the day time, and at night I can't forget. Why everything folks get to eat is priced so bloomin' high, that a purse would need, by gum, to reach well nigh unto the sky.

We used to buy the sausage cheap, about ten cents a yard, a nickel for a T-bone steak, and 'bout the same for lard.

And liver, too; land sakes alive, they used to get it free—it used to cost ten cents for lunch and less'n that for tea. And look at spuds, the Irish kind, the onions and the beets, and every other thing that comes in servin' up the eats.

And if you want a dozen eggs, the big ones and the slim, it costs you over half a bone, why say, they don't begin to touch the good old buying times, now gone a long time hence, when hen fruit used to sell galore at twelve and thirteen cents.

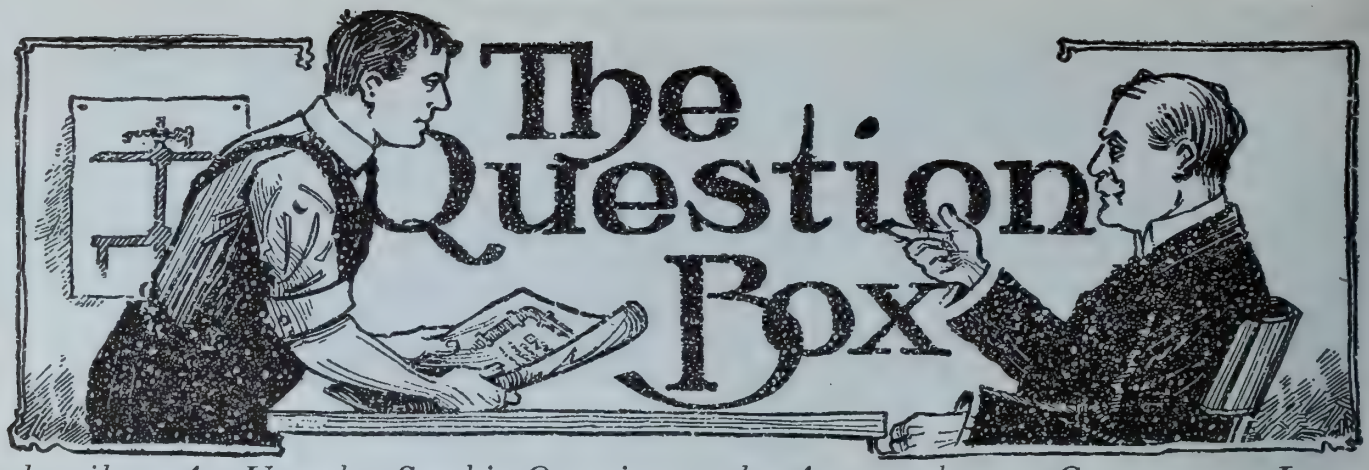
When we was kids we used to take a quarter to the store, and have a list a foot in length of what we hustled for.

And for that coin we used to get some butter and some ham, some eggs and rice, a pound of tea, and salmon in a can. We used to stack up all these things upon the kitchen range—and dig deep in our jeans to land the coin we got in change.

We passed up ham and bacon, too, and roasts of every sort, to try and keep our carcasses from wanderin' into court. And ground up steak has got the boots, rump roasts have gone likewise—we never get a hunk of ham, nor dig in on meat pies.

It is a sad, a lonely world, there's just one thing, by heck—we sometimes buy a slab of chuck what's carved from off the neck.—ARK.

and you can do both at once if you buy Victory Bonds. Don't forget that.



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

FURNACE HAS POOR DRAUGHT

Editor, Sanitary Engineer: Some three years ago a hot water furnace was installed in the house of a customer of mine, and just recently I was called in to look over the heating system because it was found that there is now a very poor draught. I must confess that I really do not appear to be able to locate the trouble; the chimney and smoke pipes are clean, the joints in the furnace I have recemented, and the doors all appear to fit perfectly. The chimney is a well built one, and is separate from all others. There are three separate chimneys, one for the kitchen ranges, one for grates and one for the furnace. All are of course built side by side together in one structure. It is what you would call a three opening chimney. Could you suggest what is the trouble, as no doubt there is some reason for the chimney not drawing as well now as it did for three previous winters.

Poor Draught

There are at least three possible causes for the above trouble. First the divisions in the chimney may be fractured and air is leaking from one to the other. To prove whether or not this is the trouble it would be well to stop up tight both the other openings top and bottom for a few minutes and take note if the draught is stronger at the furnace. If no improvement is noticed then that proves there is nothing wrong with the divisions, and they are tight.

Secondly, examine the top portion of the chimney above the roof and see if the bricks are all in good order, the pointing good, and if not, then have the fractured portion of the chimney rebuilt; just outside and inside pointing will not make a good job. When the heat gets to the top of the chimney it will loosen the pointing and the trouble with the draught will be just as bad.

Thirdly, it may be that neither of the two defects aforenamed is the cause of the trouble, but possibly another building has been erected close to the present chimney, which is obstructing a straight air or wind passage, or a tree may have grown up to a point above the chimney cap. Any or all of the above causes may have arisen, and all or any one would result in decreasing the efficiency of the draught.—Editor.

WHAT IS YOUR OPINION?

Editor, Sanitary Engineer:I would like to have you answer me one or two questions regarding a job I have been called in to do. I have done work for this customer of mine for a number of years, but now I am likely to lose him unless I can prove that my contentions are correct in connection with a proposed addition to a hot water heating system. Here are the facts of the case.

My customer has had two rooms added to the rear of his home. He has turned the kitchen into a dining room, and the two added rooms are to be used as a kitchen and bedroom above.

The furnace is large enough for an addition of 80 square feet of radiation, and I propose to run a separate flow and return pipe from two plugged outlets that are on the ends of the flow and return header, and to use a wall radiator in the kitchen and a regular single column radiator for the bedroom. My price is much higher than that of one of my competitors. I learn that he proposes to break two 2-inch elbows and replace same by two 2 x 1¼ x 2 T's. The branch on which the elbows are is already carrying all they can, and he further proposes to use two box pipe coils so as to lower the cost. He says his job will work all right, and my customer has the impression that I am trying to make the job run up too high. I have told my customer that pipe coils are not as efficient for hot water and are only fit for a fac-

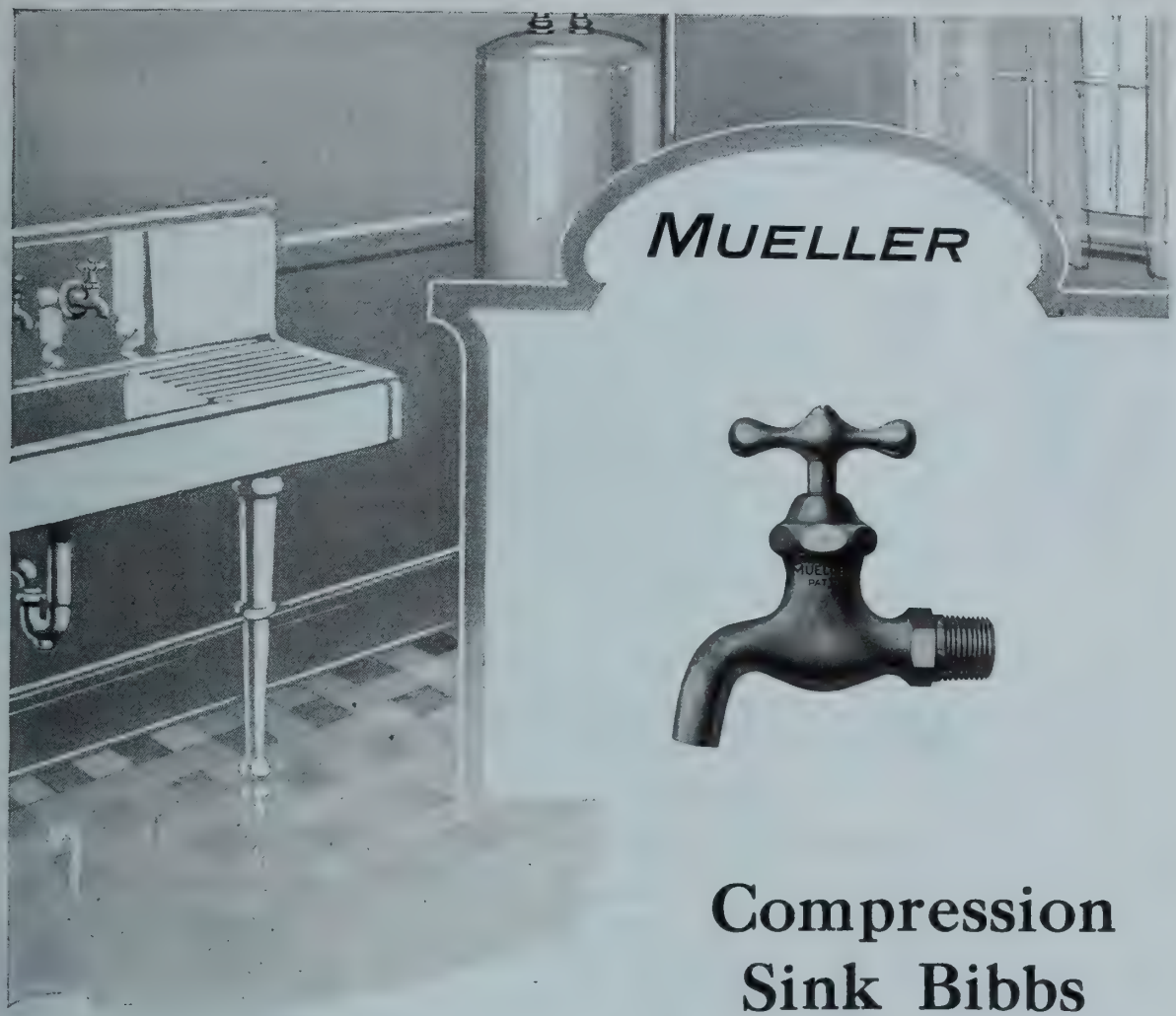
THE CASE FOR THRIFT

The case for thrift in Canada at the present time may be briefly summed up. The country has been in a state of unexampled prosperity for the past two or three years, owing, it is quite clear, to unusual war conditions. Wages have been high, profits are large and there is a total absence of unemployment. Very many workers are earning more than ever before and thousands are wage-earners for the first time. With all this prosperity and the fact that they are not accustomed to judicious disposal of their money, many spend their entire surplus seemingly on the assumption that this prosperity will go on forever.

The appeal now is to the people of Canada to immediately undertake a vigorous campaign of personal thrift, to abstain from the purchase of all luxuries and non-essentials, and to endeavor to accumulate as great a saving as possible. Naturally many people will say they are now living as economically as they can and that their standard of living has actually been lowered owing to the high prices of articles of food and clothing. This may be true, but it does not alter the fact that there is still much extravagance and that this exists to a dangerous degree when we remember the temporary character of the prosperity and the perils of the period of readjustment that will follow peace.

The practice of thrift by the Canadian people now will bring a large accumulation of national savings to secure us individually and collectively against any trying change that might occur in the economic situation. It would make possible the continuance of Canada's splendid part in the war and the maintenance of our war financing on its present sound basis. The elimination of luxuries and non-essentials would as a matter of fact, release labor and material for war purposes instead of using these great and scarce necessities for things that we could do without.

The examples of other countries should inspire Canadians to much greater effort in thrift. France has been able to face her four years of terrible trial by reason of her background of personal thrift. Great Britain is practising it as perhaps never before. The United States is fast piling up vast sums of money for the use of her own and the other armies of the Allies. Canada has done much to finance her own part in the war but no one can say that the limit of saving has been reached or even approached.



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SARNIA CANADA

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tory steam heating plant. I have also told my customer that to add more radiation on the mains now feeding present radiators is very bad practice and cannot but interfere with the heating of these radiators. All I want you to do is to give me your own frank opinion about this job and say whether I am right in my contentions or wrong. My customer is satisfied to be guided by the opinion of some outside and independent authority.

H. E. S., Sask.

There is very little to be said in reply to the above problem. It is too plain a question on the face of it. Here is a furnace large enough for the additional radiation. At present certain mains are doing good work, and there are two plugged outlets on the ends of the headers. Possibly the mains referred to are close to where the new radiation is to be installed and the competing fellow is anxious to save piping, etc. But he cannot possibly be as practical as our enquirer. No one in the first place would run a pair if mains any great distance that would be large enough to carry an extra 80 square feet of radiation, unless it had been understood in the first place that additional radiation was to be installed later, and in that case reducing T's would have been used in place of the elbows referred to. Regarding the use of coils, that is rather a question as to the efficiency, but we are not inclined to agree with the competitor's judgment.

We agree entirely with the plan our reader proposes to follow and would not care to interfere with the system in any way other than by using the outlets and running a separate main to the new radiation to be installed.—Editor.

STANDARDIZATION OF SOIL PIPE AND FITTINGS

"STANDARDIZATION of material and elimination of duplicate or unnecessary appliances in the plumbing line, in the interests of conservation of material and labor," says the "Daily Iron Trade and Metal Report," Chicago, "is to be undertaken by manufacturers of plumbing supplies, under direction of the War Industries Board. A meeting at Washington recently was attended by about 135 plumbing supply representatives, called at the request of Richard L. Humphreys, chief of the building material section of the War Industries Board. These representatives cover some 12 associations allied to the plumbing trade. They include: Brass goods, earthenware, tubular goods, enameled iron ware, woodwork, soil pipe, steam and gas brass goods, range boilers, malleable fittings, radiators, hot water heaters and marble work.

Mr. Humphreys addressed the gathering and suggested that a special committee of 12, one from each association, be elected to serve as an advisory committee of the building material section. This was agreed to and it is supposed the chairman of the committee representing each section will serve on the central committee.

Its purpose will be to take up the matter of eliminating duplications, promotting uniformity and standardizing appliances.

No date has been set for this committee taking up its work.

We believe the time was never so opportune for considering the question of standardization of materials in the sanitary and heating trade. There are thousands of styles of fittings, fixtures and piping that could be eliminated. We have discussed the matter with some of the best authorities, both from a manufacturing as well as constructional point of view. Take for example the use of so many soil pipe fittings of various shapes. Some are long-branched, T or TY; 90 degree bends are all kinds of lengths, and the use of extra heavy soil pipe is foolish, particularly when medium to-day is of such a uniform quality.

The work accomplished by the Canadian Institute of Sanitary Engineers along the line of standardization of soil pipes and fittings, should be taken advantage of now, and we feel sure that manufacturers would be only too pleased to go into the matter more thoroughly. Look at the various styles of brass ferrules, the different weights of lead bends and waste pipe, the scores of brass traps, and the many styles of bibbs, valves, etc.

The sooner the Canadian trade consider these questions of unnecessary duplications the better it will be for all concerned. The editor would be pleased to receive the opinions of any members of the trade who may have anything to say on this subject which, without doubt, is of vital importance to every member of the craft.

THE SALE OF SPECIALTIES

Continued from page 20

little gas is consumed and little wasted because this flame keeps the tank hot, which is cheaper than running a heater at a large flame, and as is usually the case a consumer will heat 20 gallons of water to draw five, and then let the other fifteen gallons cool. It is a saving to keep a tank hot all the time instead of heating water every time it is needed and then heat twice as much as is used, letting the balance cool off.

Many prefer an independent pilot light instead of a by-pass flame over the entire burner. This is a very satisfactory arrangement where the pilot is large enough, and a burner on the heater is used which is screened or gauzed and cannot backfire.

Unless the heater has a burner of this kind it is not advisable to use an independent pilot. Remember always that a burner needs only to backfire once to cause possibly fatal results. Therefore never use an independent pilot unless the burner is gauzed or screened. Even on burners with the by-pass flame there is danger of backfiring if the by-pass is set too low.

Now for the consumer—after you understand thermostats you can think of many reasons why your customers should have his gas water heater made automatic. There is the positive saving of gas. No more gas is used than is needed to actually heat the water drawn, plus that which takes care of the lost heat by radiation.

It makes the heater automatic, it acts as a safety device to prevent overheating and saves the worry about someone forgetting to turn out the heater at night, wasting gas and possibly causing an explosion.

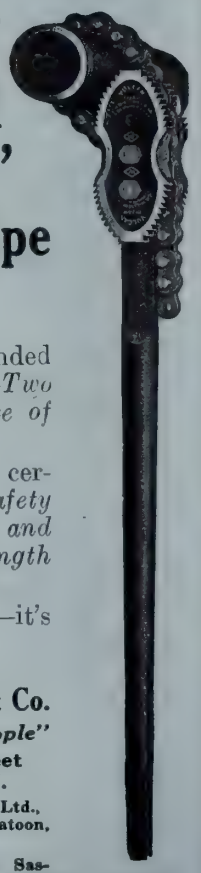
It saves footsteps running up and down stairs to light or turn down the heater every time hot water is wanted. It will provide your customers with continuous hot water night and day for kitchen, laundry, bath and what not. Without waiting, hot water is always on tap at any of the taps.

There are hundreds of homes within walking distance of every sanitary engineer's establishment where heaters are being used. Every one of these homes is a prospect for a thermostat. Each and every one can be reached by mail, by personal call, by window display, or by local advertising.

Success will go a block out of its way to dodge a lazy man.—Sun.

Any man is a success who can do his work without supervision.—Elbert Hubbard.

Williams' Improved "Vulcan" Chain Pipe Wrench



With double-ended reversible jaws—*Two tools at the price of one.*

Proof-tested and certified chain — *Safety for the operator and guaranteed strength for the wrench.*

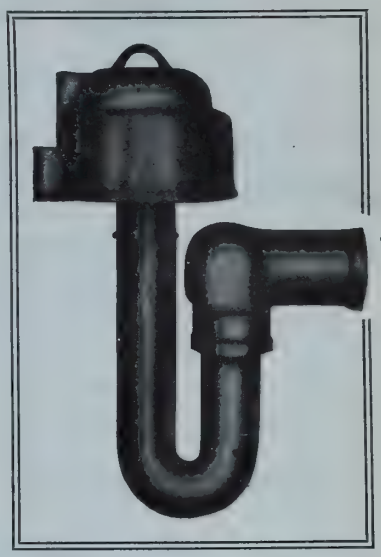
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The purchase price means nothing if the upkeep cost is not low.

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The consumption of fuel—*the upkeep cost* is lower—considerably lower.



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The Nut-Guards prevent the accidental rotation of the nut while in use.

These improvements add 25% to the usefulness of the tool.

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How 24,000 Fitters Added $1,000 to Their Profits Last Year!

IF you want to find out where a fitter stands—whether he is making money—ask him what he knows about the newest things in the business.

Ask him if he is using the latest heating systems and devices. Ask him if he is using up-to-date boilers—the best **valves, pipes** and **fittings?**

Ask him if he is using "X" Boiler Liquid!

If he is a shrewd, thinking fitter, he'll tell you he doesn't dismantle and weld leaky or cracked boilers any longer. He has found out how to give his customers a better job—and make more money for himself.

In fact, last year over 24,000 fitters used "X" Boiler Liquid—and almost every one added about $1,000 in additional profit to his income.

"X" Liquid is simply poured into the boiler. In 30 minutes it will repair every leak or crack—and make the boiler as good as new. No time is lost. No tools need be carted. No hanging around on the job.

With "X" Boiler Liquid you know in advance the time the job will take. So you make a flat price—get a definite profit—and save a lot of argument with a cranky customer.

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And in addition to making a Scientific Repair "X" Liquid will prevent Rust, Scale and Foaming!

Jobbers in Canada handling "X" Boiler Liquid:

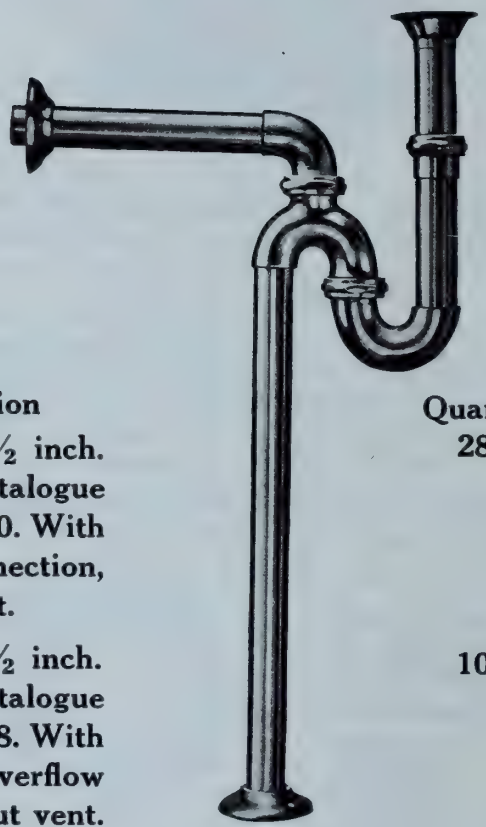
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The Dominion Radiator, Ltd.	**Winnipeg, Manitoba**
Sumner Company	**Moncton, New Brunswick**
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The Empire Mfg. Co.	**Toronto, Ontario**

"X" is not a cement or powder. It is a LIQUID. You should beware of dangerous imitations of "X" in solid or liquid form. These imitations clog the air valves. "X" Liquid is guaranteed not to be harmful—and will positively do all we claim or your money will be returned.

"X" LABORATORIES

636 Washington Street Boston, Mass.

We Can Ship from Stock
Four Different Sizes and Styles of Brass Traps



Quantity	Description
101	S Traps, 1½ inch. Official catalogue number 4460. With sink connection, without vent.
367	S Traps, 1½ inch. Official catalogue number 4458. With patent overflow plug, without vent.
286	S Traps, 1½ inch. Official catalogue number 4462. Patent overflow plug and complete with vent.
104	S Traps, 1¼ inch. Official catalogue number 4462. Patent overflow plug and complete with vent.

All these traps are made with heavy cast brass parts, ground joints and of No. 20 B&S gauge tubing. Fitted with floor and wall flanges and high-grade rubber stoppers, the stem of which is embedded in the rubber to prevent working loose.

Heavily nickel-plated and ready for shipment on day of receipt of order. Prices right.

Drop us a line at once about this stock of Traps.

Wallaceburg Brass & Iron Mfg. Company
Limited

WALLACEBURG - ONTARIO

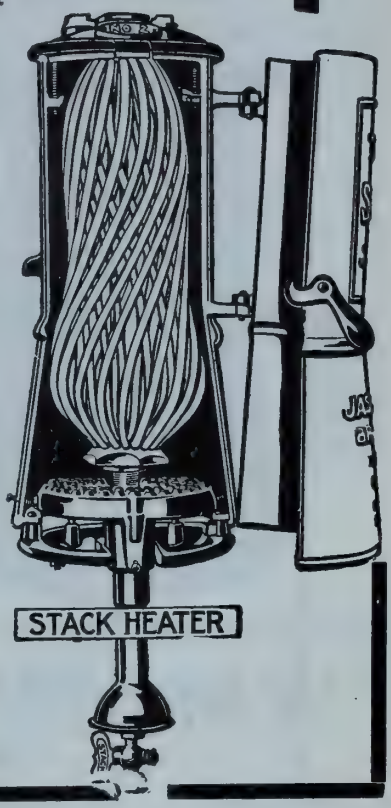
THE JAS. MORRISON BRASS MFG. CO. LIMITED TORONTO, ONT.

There's a Reason Behind This Demand For Stack Heaters!

TRADE MARK J.M.T

The fact that Stack Heaters afford a considerable saving year out and year in makes a big impression on the prospect.

Looking ahead, he sees that the time and money-saving advantages of a "Stack" more than make it a paying investment. You can prove every statement you make in showing the advantage of a "Stack" over any other heater.

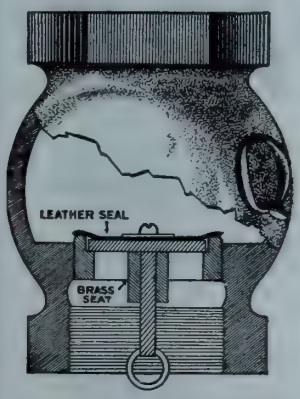


Most profitable for you to handle in the long run.

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93-97 ADELAIDE STREET WEST, TORONTO

IT JUST CAN'T LEAK



A SURE "Q"ER FOR PRIMING TROUBLES

A foot valve that just can't leak is one of the most important parts in a pumping equipment. Every person with any pumping experience will tell you that if the foot valve will not hold, the strain on the pump is doubly increased. In fact 50 per cent. of the efficiency of the pump depends upon the foot valve.

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GALT CANADA



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Take a look at this coil and you cannot fail to see some splendid points in its favor over any other coil on the market. This design of M and T Coil is made to fit any hot water or steam boiler. The extended surfaces make it a quick heater and the tail stocks are separate castings, specially grooved so as to be easily broken off at any desired length.

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Over 50,000 Daisy Hot Water Boilers Now In Use—Are *You* Selling Your Share?



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BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES Black and Galvanized All Sizes

Ask your jobber for CT Brand

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Montreal Works: Lachine, Can.

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The time to put on fire insurance is before the fire. The time to prepare for after-the-war conditions is before peace comes.

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By R. C. McWane

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Every sanitary engineer should be the possessor of this book. It deals with pipe making of all kinds, cast iron, wrought iron, steel, wood and tile pipe. It is valuable because it gives the users of pipe a true idea of how pipe lasts under various conditions when in service.

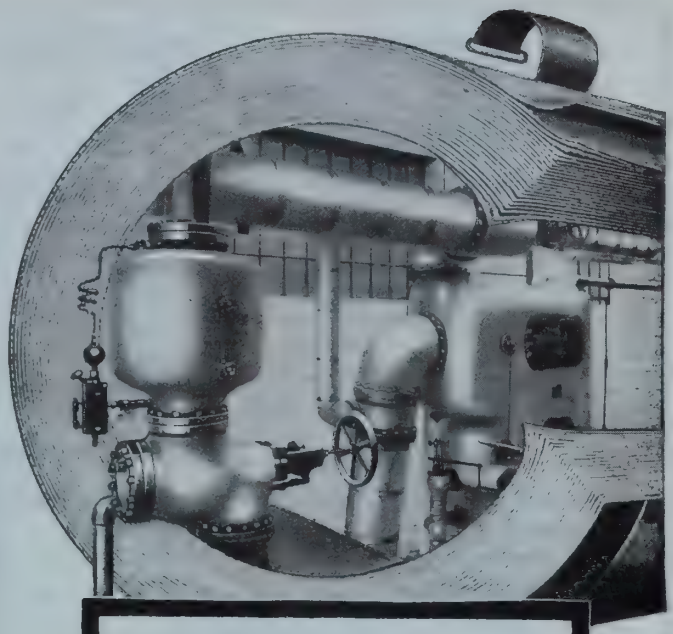
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Balance savings against cost and you'll specify Johns-Manville Heat Insulation.

One way to make sure of maximum pipe covering efficiency—to reduce the heat losses and cut down your "cost per H.P. hour"—is to specify Asbesto-Sponge Felted Heat Insulation. Test after test by unbiased investigators has proved it to be not merely highly efficient but the most efficient heat insulation manufactured.

And more than that, it's an insulation of **known** efficiency, which means that you can balance against its cost the known savings it will effect. It enables you to cut out guesswork—to buy your insulation on a common sense twentieth century basis.

Let us figure what Abesto-Sponge Felted will do for **your** plant.

THE CANADIAN
H. W. JOHNS-MANVILLE CO., LTD.
Montreal Toronto Vancouver Winnipeg
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JOHNS-MANVILLE SERVICE COVERS THE CONTINENT

JOHNS-MANVILLE



PIPE THREADING AND CUTTING TOOLS

One Man Can Thread up to 12 Inch.



Cuts Without Burring

No. 1 cuts from ⅛″ to 1″
No. 5 cuts from ½″ to 2″
No. 10 cuts from 2½″ to 4″
No. 15 cuts from 4″ to 6″

You cannot afford to expect your men to make horses of themselves. If they did they could not keep it up. Our tools save time, do better work and make life worth living for your men.

Ratchet	Geared
No. 6—¼″ to ¾″.	No. 41—2½″ to 4″.
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No. 26—1″ to 2″.	No. 80—4½″ to 8″.
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The Borden-Canadian Company
TORONTO, CANADA

"JUST ONE MINUTE"

To call your attention to the Famous B & C Floor and Ceiling Plates.
Our No. 15 style narrow flange designed for the Canadian trade.

One of many styles

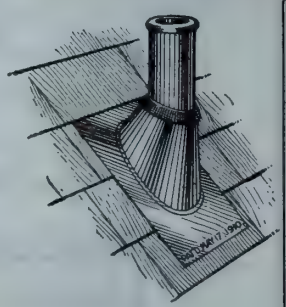


No. 15

Handsomely nickel-plated or plain
Sizes ½ to 2″

Stock now carried by our Canadian Representative
W. H. CUNNINGHAM & CO., 183 Church St., TORONTO, Can.
THE BEATON & CORBIN MFG. COMPANY
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The SIMPLEX Adjustable Roof Flange



Fits any roof from ½ pitch to flat—just slide it down the pipe and it will conform with the pitch of the roof.

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Made in all sizes—For sale by nearly every jobber
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IT IS IMPORTANT!

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Second-Hand Pipe

1-2″ to 4″
Black and Galvanized
Send us list of your requirements

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Works: LACHINE, QUE.

"HAUSE" PIPE JOINT CEMENT

For steam, water, air, oil, gas, gaskets, etc. The cement that cements. Sets like gum. Allows no leaks.

The Great Value of "HAUSE PIPE JOINT CEMENT" lies in its peculiar chemical properties which permits of its hardening and expanding after the joints are made up. In making up joints it has the same effect as a lubricant on the best graphite, and while the joints may be made and broken readily, a perfectly tight joint is maintained at all times. Comes in 1-lb., 5-lb., 15-lb., 25-lb., 50-lb. cans, 100-lb. barrels. Manufactured in ready mixed and powder form. Ask your jobber for prices, or write us direct.



Manufactured in Ready Mixed and Powder Form.

Made in Omaha, Neb., U.S.A., by

Chas. F. Hause Mfg. Co., Inc., Omaha, Neb.
Canadian Representative: Empire Mfg. Co., Ltd., Toronto.

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It's a real little wind engine



Is a positive suction fan that ventilates

The "Bicalky" will dispense with all auxiliary heaters on local ventilation systems.

It is, as far as we know, the most scientifically constructed, self-propelled fan ventilator on the market.

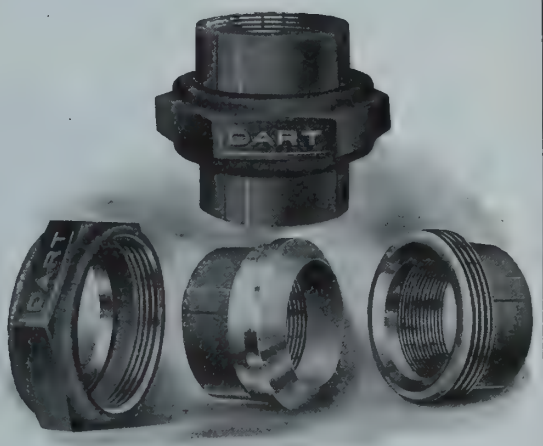
Write us for full particulars.

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DART UNIONS

Assure Positive Connections
And Permanent Ones

There can be no rust or corrosion at the joint of a Dart Union, because **THE FACE AND SEAT ARE BRONZE.**



All jobbers sell them.

Manufactured and Guaranteed by
DART UNION COMPANY, Limited
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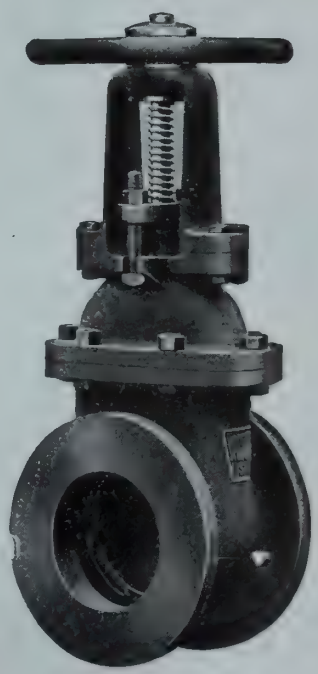
There Are Lots of Gate Valves

Advertised and Sold



but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.
Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.
Approved by the Fire Underwriters' Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario



ABSOLUTELY
THE TANK
WITHOUT A FAULT



VITRO



VITRO

THE TANK WITH THE TROUBLE LEFT OUT

It was not mere chance that made the **VitrO** tank the success it is.

We studied the W.C. tank problem from every angle, and after years of experimenting we found out the right material which is combined to make a real no-trouble tank. That's the **VitrO.** It's a real winner.

Made in one piece, they can never leak. They never fail to make good, because we never fail to make them good.

Galt Brass Company, Ltd.

Galt, Canada

VICTORY LOAN NUMBER

SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

Vol. XII. Publication Office, Toronto, November 1st, 1918 No. 21

BUY VICTORY BONDS

TILL IT HURTS

THAT'S OUR MESSAGE TO YOU



THE BOYS ARE GIVING THEIR ALL FOR YOU.
YOU'RE ONLY ASKED TO LEND.

The man who does not strain every nerve to buy Victory Bonds does not deserve to live in Canada. He does not, by his conduct, appreciate what our boys have done for him in France and Belgium.

No, and he does not realize what Germany would do to every Canadian if the Kaiser and his horde were on Canadian soil. Let's not dwell upon such a thought, but rather upon the brighter side, which will be the result of buying Victory Bonds.

Every Canadian citizen should join in the cry: Buy Bonds—Buy Bonds for your boy and mine.

EMPIRE MANUFACTURING CO., LIMITED

LONDON TORONTO

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While



A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for BEAVER BRAND CAST IRON ENAMEL WARE

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General Offices and Factory: Amherst, Nova Scotia

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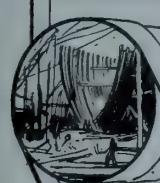

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DOMINION
Rubber System
Belting Service is Dominion Wide

No matter what your business or where it is located, there is within telephone distance of your plant, a branch of the Dominion Rubber System and a belting expert.

These technical experts are not merely salesmen, *they know belting* and its requirements thoroughly and their services are at your command, without charge, whether you are a customer or not.

Put your problems up to the Dominion Rubber System experts—*place your belting equipment in their care—they will shoulder the responsibility* for giving you efficient service in all your belting no matter what it is used for.

They are able to "speed up" your production—reduce your manufacturing or belting costs or eliminate unnecessary delays and "shut downs."

The Dominion Rubber System is not only the largest but the oldest organization of its kind in Canada and has specialized in belting for more than fifty years—its entire facilities and Dominion Wide Service are at your command.

If you are in trouble or in doubt about a belt, 'phone, wire or write our nearest branch and *let us prove that our Belting Service means more than just selling belts.*

Canadian Consolidated Rubber Co., Limited
Head Office, Montreal

SERVICE BRANCHES

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CANADIAN CONSOLIDATED RUBBER CO. LIMITED
DOMINION
RUBBER SYSTEM
AND ASSOCIATED COMPANIES

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FULLER WORK REPAIRS

Assortment Including Stems, Eccentrics, Nuts, Screws, Stem Caps, Lead and Felt Stem Packings.

Complete line in Catalog "C" Listed Separately

For Repairing All Makes of Fuller Bibbs Basin and Bath Cocks



This is Assortment No. 3235

Also Repairs for All Makes of Compression Bibbs, Basin and Bath Cocks

Canadian Wolverine Company, Limited
Chatham, Ontario

Pipe Fittings

Made in Canada



The Brand that has the Quality

Brand Pipe Fittings, etc., give a service and satisfaction that will invariably get you re-orders and much new business as well.

A trial of the goods will prove this claim.

CAST IRON FITTINGS

With this brand mean fittings made with iron of high tensile strength—proper proportions and correct tappings.

RECESSED DRAINAGE FITTINGS

MALLEABLE FITTINGS

With this brand mean fittings made of Air Furnace Refined Iron, reamed and tapped to gauge with perfect threads.

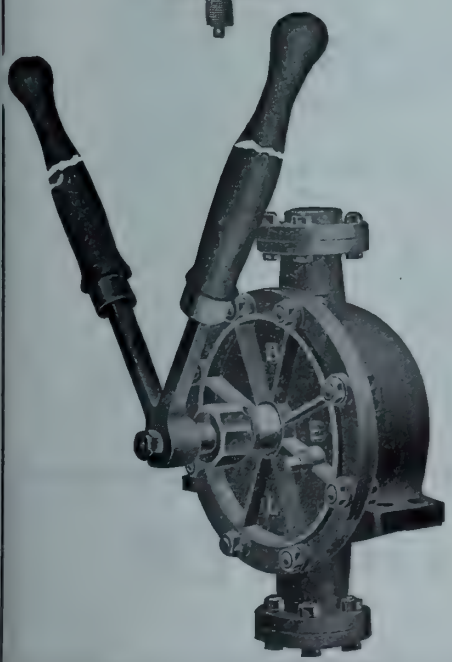
Standard and Extra Heavy Flanged Fittings and Flanges. Galvanizing Malleable and Gray Iron Castings of all Kinds.

International Malleable Iron Co., Limited, Guelph, Ontario, Canada









FIVE WORKS—OVER 3,000 EMPLOYEES

It is our intention after the War to devote our energies to the intensive production of the following Specialities:

Gunmetal and Brass Valves and Cocks.
Steam, Water and Compressed Air Fittings generally.
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Semi-Rotary Pumps.
Extruded Brass and Bronze Bars.
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Cast and Malleable Iron Cocks and Pipe Fittings.
Pressure and Vacuum Gauges.
Injectors and General Jet Appliances.
Engine Governors (Pickering, Proell and other types).
Spraying Machines for Insecticides and Limewashing.
Coppersmiths' Work.
"Stella" Brand Alloys, Manganese Copper, Silicon Copper, Ferro Zinc, Phosphor Copper and Tin, etc.

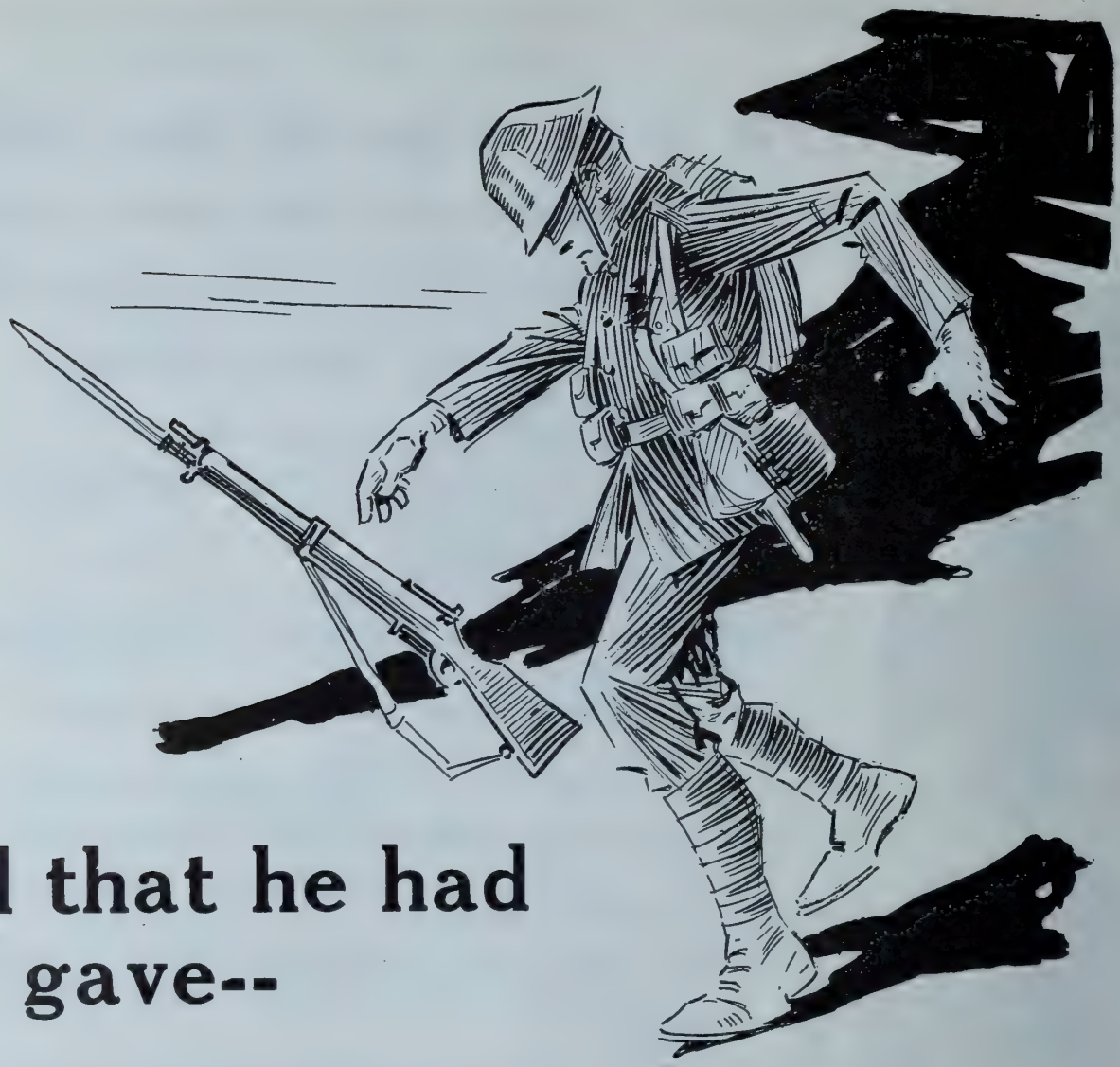
Business After the War

If you are interested in any or all of the lines mentioned and are in a position to take a hand in the energetic distribution of the same, please communicate with us NOW to our Head Office at the address below.

UNITED BRASSFOUNDERS and ENGINEERS, Limited

EMPRESS FOUNDRY

Cornbrook, Manchester, England



All that he had he gave--

Take hold where he left off—keep up your end which is furnishing money to buy the necessary material and equipment to successfully end this war. That is the reason why we recommend that you buy

VICTORY BONDS

You are not asked to give, you are asked to lend. And at good interest at that, with the whole Dominion as security.

The soldier gave his all, his life, that this world may be a better place to live in. Thousands have fought and bled and died, for your liberty, a liberty they can never know. The least you can do is to pay the bill.

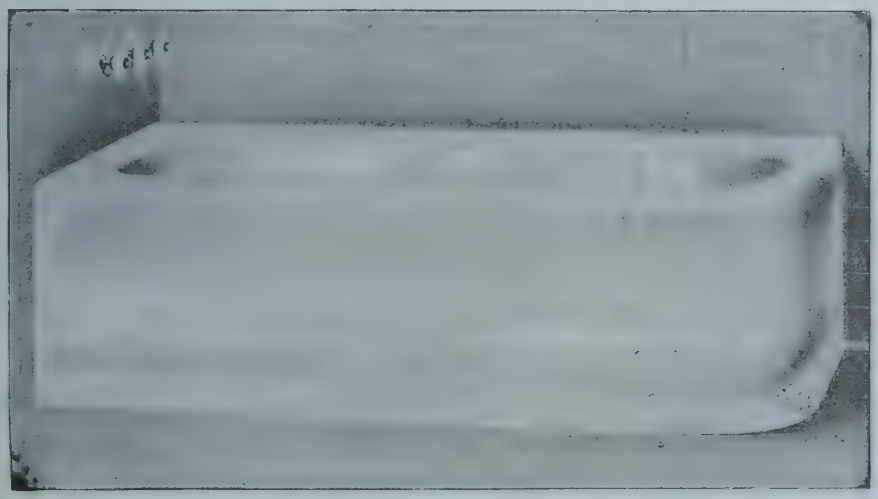
Buy Victory Bonds—more bonds is our message to you.

This Space Donated to the Success of the Victory Loan by

ANTHES FOUNDRY, LIMITED

TORONTO and WINNIPEG

"Standard"
"Perfection" Built-In Baths
Made in One Piece Enamelled All Over



These Baths represent the last word in design and finish, and are made to build into Right or Left Hand Corner or into a Recess.

The "Perfection" Built-in Bath is only 17½ inches high, therefore convenient. It builds into walls and floors, the absence of all dust-collecting cracks and corners, meaning bathroom sanitation.

Made in 5 and 5½ foot sizes.

Illustrations on request.

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Montreal:
4 Beaver Hall Square

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31 Canada Life Building

Vancouver:
847 Beatty Street

"MADE IN CANADA"

Lend Him A Hand

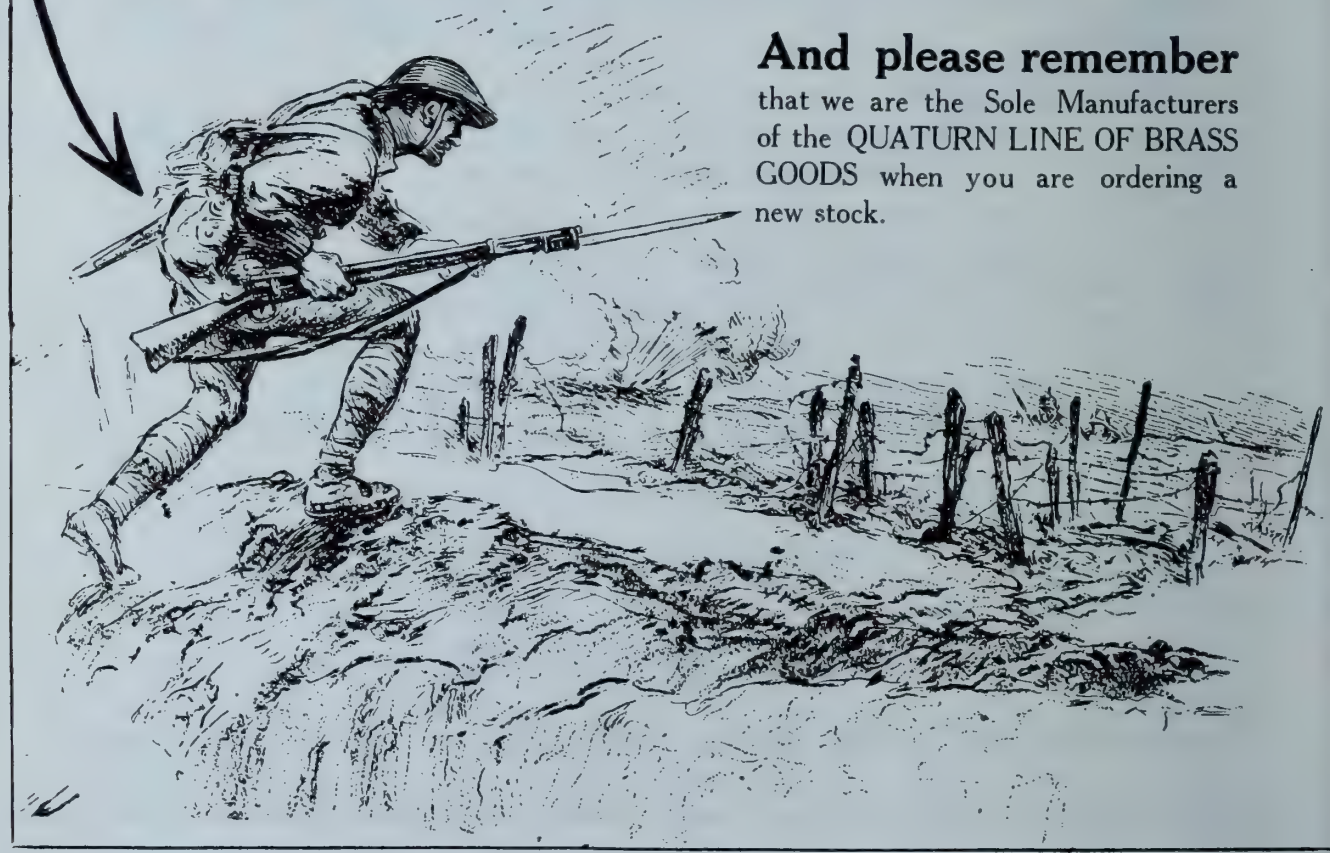
This is the Message to You From the Management of

The Wallaceburg Brass and Iron Manufacturing Company, Limited

BUY VICTORY BONDS

THIS Canadian lad of ours on the battle-fields of France. He's a lad to be proud of as fine a soldier as the world has ever seen. He will do his part, ***but he is depending on you and me to help him to VICTORY.***

We have a splendid army of fighting men. We can make them the best equipped army in the world. We can make them invincible for the coming big offensives United action by us means decisive action by them. This means VICTORY.



And please remember that we are the Sole Manufacturers of the QUATURN LINE OF BRASS GOODS when you are ordering a new stock.

DONATED TO THE SUCCESS OF THE VICTORY LOAN BY THE

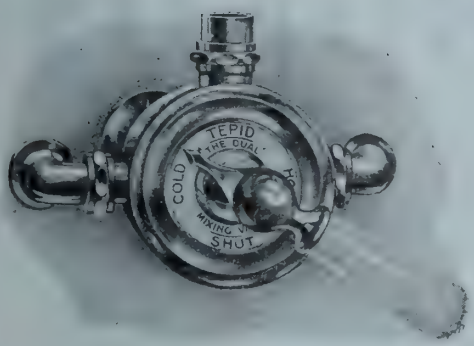
Wallaceburg Brass & Iron Mfg. Company
LIMITED
WALLACEBURG - - ONTARIO

G. & W. G. GUMMER, LIMITED

EFFINGHAM BRASS WORKS,

And at
9 Fenchurch St.,
London

ROTHERHAM,
ENGLAND





"Dual" Mixer

A valve that really mixes Hot and Cold Water, and maintains a uniform mixture.

For ease of operation, simple construction and easy installation, it has set a new standard of efficiency.

Cold Water must be turned on first, no possibility of scalding.

Made in several forms for Showers, Sprays, Operating Rooms, etc.

At the well-known works of Messrs. Brunner, Mond & Co. these valves provide baths for 2,500 employees.

G. & W. G. GUMMER, LIMITED

Manufacturers of every description of

Engineers,' Plumbers' and Sanitary Quality Brassware

The Best Way You Can Protect Canadian Institutions Is To Buy

VICTORY BONDS

Because, without doubt every dollar's worth of Victory Bonds subscribed for, will pay for goods bought from Canadian Manufacturers. Every dollar invested in Victory Bonds will bear its share of wages to Canadian workers. Therefore, when you buy Victory Bonds you finance Canada, and you are paid for so doing.

But if you do not subscribe to this Victory Loan you create an increased national debt, the principle and interest you will have to pay, and the money leaves the country. Almost the same argument can be used when you do not buy the best Brass Goods.

YOUR REPUTATION IS AT STAKE WHEN YOU BUY INFERIOR BRASS GOODS

C. B. Brass Goods, when installed are a gilt-edge investment. They are a lasting asset, because they are made in a modern factory by Canadian expert brass workers.

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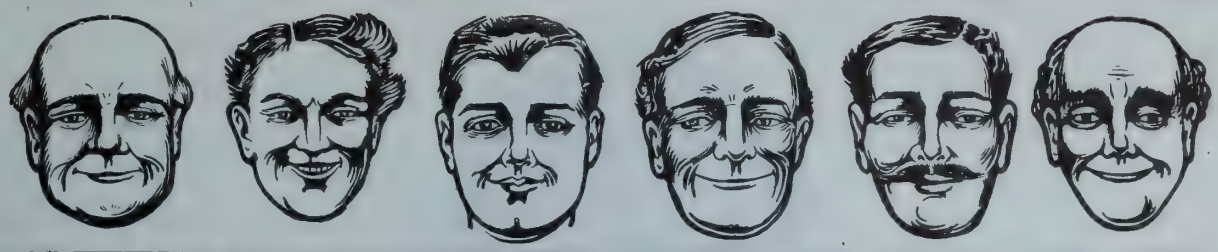
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Our service is not the **"hit or miss"** kind; it is based upon practical experience in the plumbing trade.

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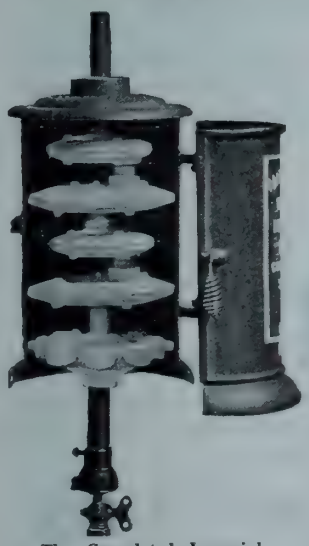
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The Henderson Business Service, Box 123, Brantford, Ont.

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The Imperial line of gas water-heaters are the products of more than 20 years' experience. They have all the advantages of any other type and none of the disadvantages.

Perfect circulation is what we claim, and can prove it. Every drop of water must pass through every section before entering the boiler.



Sectional View Showing Water Flow

Make Canada stronger by patronizing Canadian institutions, and back up the country still further.

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Goodwin & Company, Limited, Sarnia, Ontario, Canada



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SHALL this little girl grow up in the sort of Canadian home we know, healthy and happy? Shall she have the advantage of living and learning in a free land, under free institutions? Shall such children develop into Liberty-loving citizens that a free Canada may be proud of?

Canadians have fought valiantly, and died gallantly, to win for themselves and hand down to their posterity the blessings of liberty, justice, self-government and equal opportunity. This precious heritage, bought at a great price, is threatened.

The question which to-day confronts Canada, and you as an individual, is whether or not a free Canada is worth fighting for

Are Canadian children in this and all future generations to receive unimpaired the legacy of freedom of which we are now the custodians, or shall their country be turned over bodily to the brutal, rapacious, power-mad enemy which has forced us into this war?

This question cannot be answered by word of mouth, but by deeds alone.

Let your answer be your investment in

Victory Bonds!

Donated to the Success of the Victory Loan by

THE CANADA METAL COMPANY, LTD.

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WE HAVE EVERYTHING FOR THE PLUMBER



Buy Victory Bonds

TO THE LIMIT AND THEN SOME

Don't listen to any Hun peace talk. But if you do, answer such twaddle by subscribing for Victory Bonds even if you have to borrow money to do so. That is the message of this, your only trade paper.

Don't be carried away with any German peace talk these days. It is all a lot of nonsense. When such propaganda work is in evidence it is only with a view of making people think that money will not be required if peace is soon declared.

Victory Bonds must be bought for the purpose of not only winning the war, but also to bring back the boys and assist in paying the expenses that must be entailed in the work of demobilization.

THIS SPACE IS DONATED BY

SANITARY ENGINEER

PLUMBER AND STEAMFITTER OF CANADA

TORONTO

"The Power of the West"

AS soon as peace is in sight, politics will again come into play in Canada and then the West may hold the balance of power. Such is the prediction made by J. K. Munro, special political writer, in November MACLEAN'S. He thinks that the Western tail may wag the Canadian dog and that this explains why statesmen and others are trying to-day to get both hands on the tail. An outspoken article—incisive, humorous, fearless, unbiased. Read it—"The Power of the West."

Germany Should Pay Canada's War Debt

Had Germany won the Junkers intended to seize and divide Canada. Writing in the November issue of MACLEAN'S MAGAZINE, Lieut-Col. J. B. Maclean contends that the war debt we have piled up should be paid in cash by Germany as one of the peace terms. He makes a vigorous presentation of Canada's case.

Chronicles of the Klondyke

The real story of the great gold boom is being told for the first time by E. Ward Smith, who was treasurer, assessor, clerk and tax collector of Dawson City during the Yukon stampede. His series starts with "My Recollections of Early Strikes"—Strange stories of how men stumbled on tremendous fortunes in the frozen North. The author knew everyone in the Klondyke and saw everything that went on at first hand.

Bright Stories—Vital Articles—Famous Writers

The important articles and the big stories that are being written in Canada by the best Canadian writers are always found nowadays in MACLEAN'S. Here's a partial list of the November bill:—

The Minx Goes to the Front - **C. N. and A. M. Williamson**
Better Dead—The Silly World of the Spiritualists - **Stephen Leacock**
The Strange Adventure of the Staring Canvas - **Arthur Stringer**
Family Pride - **Theodore Goodridge Roberts**
The Three Sapphires - **W. A. Fraser**
The Life of Mary Pickford - **Arthur Stringer**
We Must Tighten Our Belts - **Henry B. Thomson (Chairman, Canada Food Board)**
Lenix Ballister—Detective - **A. P. McKishnie**
Business Outlook - **Investment Situation**
Women and Their Work - **Books of the Month**

World Happenings in a Nutshell.—"Review of Reviews Dept."

The periodicals of the world are searched to get the best articles on current events. For instance, November MACLEAN'S contains: The Starving of Lille, The True Story of the Jameson Raid, Germany's Fleet Will Come Out? Mysterious New City in France, The Woman Who Caused Russia's Defeat, Hypnotism Cures Shell Shock, How Turkey Planned to Butcher British, Queen Mary is Accomplished Letter Writer, Why Palestine Was Captured.

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Over 60,000 Canadian Families Buy

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"CANADA'S NATIONAL MAGAZINE"

NOVEMBER ISSUE

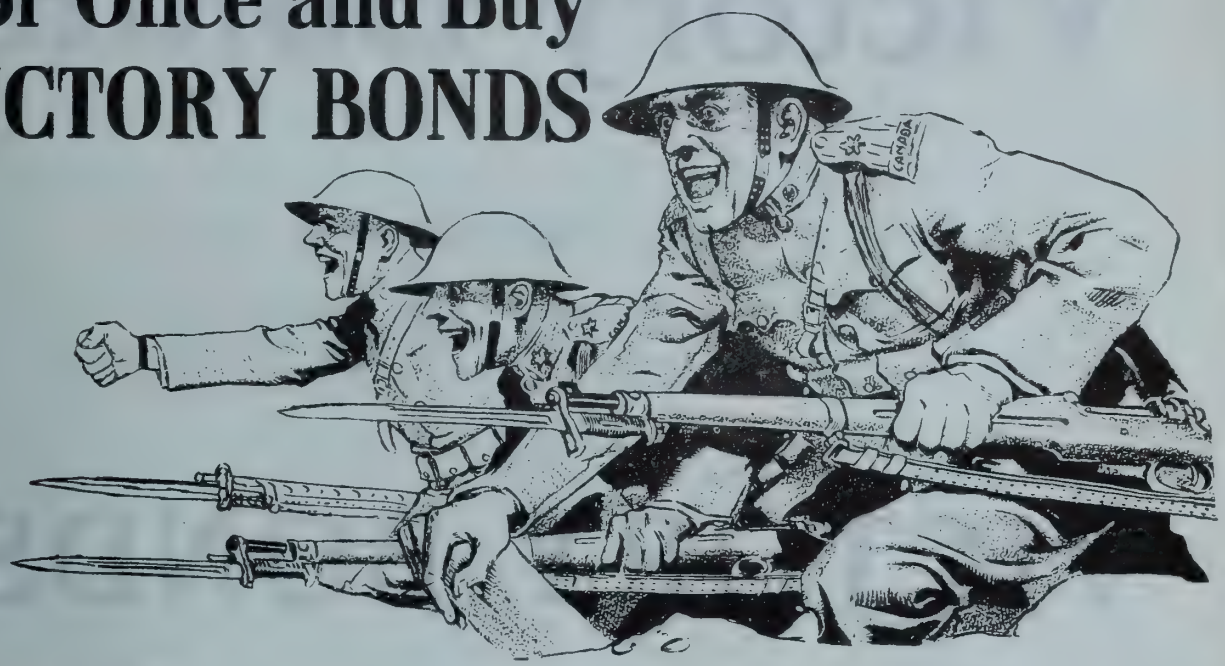
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For Once and Buy VICTORY BONDS





You Can Buy Victory Bonds

With Some of the Money
You Make from the Sale of

CLARK TEMPERATURE BOOSTERS

You Can Do More!

You can help save thousands of tons of coal from the moment you instal a Clark Temperature Booster on every hot water job until the end of time.

The only difference between buying Victory Bonds and selling Clark Boosters is that the former will be all redeemed and the war a matter of ancient history, long before Clark Boosters cease to save coal.

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GALT ONTARIO CANADA

Victory Bonds

Are a good investment and pay a good rate of interest.

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Means more business for Canada. More building and more work for those engaged in the building industry.

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SANITARY ENGINEER

VOL. XII. NOVEMBER 1, 1918. No. 21

American Society of Sanitary Engineering Hold Thirteenth Annual Convention in Chicago

Some Splendid Research Work Done During the Past Year, and Interesting Papers Read

THE thirteenth annual convention of the American Society of Sanitary Engineering was held this year at the Congress Hotel, Chicago, at which event, delegates from all over the continent were present. October 14, 15 and 16 were taken up, the first two days to real serious business, the last day was spent in pursuit of pleasure. The entertainment committee had planned a drive to the Great Lakes Naval Training Station, at Waukegan, Ill., the place where Uncle Sam is training thousands of blue jackets for war service.

Following the invocation of the Reverend Father McNamee, the representative of Mayor William Hale Thompson, Mr. Harry B. Muller, Chicago's prosecuting attorney, delivered an address of welcome to the delegates and members present. He referred to the important work being done by the sanitary engineering dept., of Chicago and the faithful staff of plumbing inspectors. Their untiring efforts no doubt were being felt throughout the whole city. Said he "Sanitary plumbing is one, if not the greatest essential of a people, whether in town, city or rural district. It is really a fundamental factor in preservation of public health. And sanitary engineers are in no small measure the custodians of the health of the people, and in so far as you realize the responsibility assumed by you, you will no doubt see to it that the best plumbing is none too poor if the health of the community in which you labor is to be safeguarded."

In the absence of president, Wm. C. Groeniger, who is serving Uncle Sam and the Allies somewhere in either South Africa or the Holy Land, by solving a number of problems on sanitation, first vice-president L. A. Cornelius, of Grand Rapids, Michigan, occupied the chair, after Geo. J. Delin, Chicago, chairman of the convention committee presided at the opening preliminaries.

Cable From President

Acting president L. A. Cornelius, then read a cabled message of greetings for a successful convention from president Groeniger, stationed at that time in Palestine, which came through the secretary of State Lansing.

In the absence of Dr. John Dill Robertson, the Commissioner of Health, who it was planned, was to have addressed the convention, but on account of the influenza epidemic found it impossible to be present, past president Claffy, delivered a few words. He then followed on by an address entitled "The Standardization of Plumbing Codes."

He emphasized very strongly the need of a standard of trade terms—first of all, because said he, terms used in one locality may not be taken to convey the same meaning in another, pointing out that as there were no distinct methods of interpretation of terms, disputes very often arose, and such being the case it was very difficult to enforce certain laws and by-laws or sections thereof.

It would be seen therefore that first of all trade terms should be standardized and defined properly before very much progress could be hoped for in arriving at a uniform plumbing code.

Monday Afternoon Session

After calling the convention to order at 2 p.m., acting president Cornelius



Delegates and Ladies in attendance at the American Society of Sanitary Engineers held recently in Chicago. In the front row are the officers of the Society for 1917, *some of which were later re-elected for* 1918.

moved that the following telegram, which he read and which was carried unanimously, be sent to president Wilson:

President Woodrow Wilson,
Washington, D. C.

"The American Society of Sanitary Engineering, at its annual convention to-day, and by unanimous vote, directs me to inform you that its membership, individually and collectively, do most whole-heartedly approve of the war aims and purposes of our country as expressed by you, and to the end that our enemies may be crushed and a world-wide and enduring peace assured. We pledge our support unreservedly.

"L. A. Cornelius,
"Acting president, A. S. S. E."

Recent Investigations of Iron Pipe in Plumbing Installations

Thos. J. Claffy read a splendid paper on the above subject, which was illustrated my lantern slides. He proved conclusively that one thing more than any other was that pipe should not be called what it is not, he cited cases by the dozen where wrought iron pipe had been specified when buildings were under erection, but that the ravages of time had proved that large quantities of such so called wrought iron pipe was nothing but steel. The lantern slides showed up splendidly and while some pipe appeared to have lasted longer than others, such cases only went to prove that some were of a purer grade of iron some poor, while others were proved to be steel.

The whole investigation, however, was based upon a study of pipe terminals as they appeared on the roofs of buildings in Chicago.

The next item on the programme was that of an address on the "main house trap problem," by Edwin Newsome, editor SANITARY ENGINEER. But owing to the fact that Mr. Newsome had the misfortune to lose his voice somewhere between Toronto and Chicago he had to delegate past president Claffy to deliver the address. (This appears on another page in this issue).

Mr. Claffy then made a few remarks as regards a number of points raised in the paper just read, and strongly approved of the arguments given. He could not see how any sanitary engineer these days could consistently approve of the use of a main house trap, and had never yet had the opportunity of reading any real basic reasons why it should not be forever eliminated.

A discussion then followed which was still further prolonged when Mr. Claffy moved that the American Society of Sanitary Engineering go on record as disapproving of the use of the main trap on house drain installation. This brought several members to their feet to protest against the passage of the motion. But even those dissenting members acknowledged that they would not like the subject to be voted upon. Among those protesting were L. J. Devine, burgh, Pa.; and C. A. Rainger, Cleveland, Ohio.

Chas. B Ball, one of the leading authorities on sanitary engineering construction, and chief sanitary engineering commissioner for Chicago, said that such a contraption was not now permitted in Chicago, that its use was not allowed in Washington, D. C., and that in all systems of plumbing it is exceedingly desirable that the main house trap should be eliminated.

One member arose and stated that the main house trap was the only protection a person had from having sewer gas enter his home, etc., and then one might as well live in a sewer as in a house where no main house trap existed. This statement brought Mr. Claffy to his feet. He took exception to such a statement, and said that an assertion like that was not based upon facts, but rather upon imagination. It is only by the free circulation of air through a plumbing system that it can be kept odorless. A. C. Shaver, chief state plumbing inspector, Pasadena, Cal., arose and stated that he was heartily in favor of the Claffy motion. He pointed out that its use was not permitted in the State of California, and that its elimination would be one of the most progressive steps that could be made by the society. However, it was decided that the motion should be given further consideration at the Tuesday morning's session at which time it would be taken up in connection with the discussion under heading of a National plumbing code.

Tuesday Morning Session

The first matter to be given a hearing was that of an address on wrought iron pipe, by N. Bowland, of the A. M. Byers Company, Pittsburgh. This was illustrated by stereopticon views, and the many phases to be considered between steel pipe and iron pipe, both of which may be "wrought," was very interesting and valuable. He cited cases where specifications had called for "wrought pipe," and said that such a term was on the face of it, misleading, whereas no clearer definition than wrought iron pipe could be desired, except that to such a term the word "genuine" would beyond doubt be a more specific term.

He showed that unless the trade as a whole would insist upon demanding "genuine," or "wrought iron pipe," that they would likely continue to be furnished with "wrought pipe," and that such pipe could be anything, steel, steel scrap or a mixture which very few chemists or metallurgists would be able to give a scientific definition thereof.

Acting president Cornelius then read a very interesting paper on the standardization of brass pipe and traps in plumbing systems.

He declared, however, that to arrive at any standards for traps and waste pipes until some standards for the ventilation of same had been arrived at, would be the height of folly.

He read the ruling of the War Industries Board relating to the many restrictions placed upon plumbing goods, particularly those bearing upon brass waste pipes, vent pipes and traps, etc. Many of the members were in favor of protesting strongly to a number of the rulings, but as the speaker stated, it was absolutely no use trying to approach the War Board on this matter, in view of the fact that winning the war was the first and most pressing matter on hand.

However, in the end it was decided that something should be done in the matter and a resolution was read and adopted which recommended that a delegate be sent to Washington, D. C., to interview the officials of the War Industries Board, and that the matter be taken up, also that plans and specifications regarding plumbing installations now being installed in war worker's houses should be of a higher standard.

Election of Officers

Under the order of unfinished business the following were elected to office in the society:

President, Wm. C. Groeniger, Columbus, O.; first vice-president, C. A. Rainger, Cleveland, O.; second vice-president, L. J. Devine, Elizabeth, N. J.; third vice-president, James R. Walker, Waterbury, Conn.; fourth vice-president, Thomas J. Lee, Pittsburgh, Pa.; fifth vice-president, George R, Stolz, Milwaukee, Wis.; sixth vice-president, George J. Dehn, Chicago; seventh vice-president, Otto Meinert, Davenport, Iowa; eighth vice-president, Professor Arthur Bateman, Chicago.; ninth vice-president, Edwin Newsome, Toronto, Ont.; tenth vice-president, John G. Mitchell, Chicago.

A. J. McGookin, of Newark, N. J, whose term on the board of directors had expired, was re-elected as a member of that body.

The society accepted an invitation to hold the 1919 convention in the city of Cleveland, O.

KEEP UP OUR PROSPERITY

"The Victory Loan is a vital factor in the creation and continuance of our prosperity. The great bulk of our chief products are bought by Great Britain for the use of her civilian population at home and her armies in the field. She buys the salmon catch of the Pacific, she buys the exportable surplus of the wheat of the western prairies and of the flour manufactured from it. She buys the cheese of the eastern dairy farmer. She buys the output of the hundreds of munition plants of Canada which, in turn, take the product of our great steel plants. This means the employment of tens of thousands of operatives. How does Great Britain pay for all these products? For the greater part the Dominion Government furnishes her with the money. Where do we get the money with which to supply her? From our Victory Loans."—Sir Thomas White.

Many Reasons Why Bonds We Must Buy

Not Only Because Victory Bonds Are Needed to End the War, but Also Because We Will Have Lasting Obligations to Pay to Our Boys When They Return to Civil Life

HOW many persons are there in Canada who really know what they are doing when they buy Victory bonds? How many are there who have an idea that they are simply loaning the money to the government for the purpose of paying the cost of the war? To the first question, we doubt if there are many really know what they are doing, or can reckon what the results would be if every loan that may be launched is not more than subscribed for.

In the first place, to buy Canadian bonds is really and truly making every person's heritage more secure in Canada. If money is not forthcoming, or even if each loan is not oversubscribed, it is bound to give an impression to citizens in other countries that we are either not as wealthy as reported to be, or that we have not faith in Canada and her resources. And if we Canadians have not, how can we expect other nations to have faith in us?

Another thing, our boys have won world-wide glory, they have faith in Canada, and they have faith in you, Mr. Reader, they are trusting you with their lives every hour, every moment that they are away from home. These boys will, we hope, soon be returning home; we are looking forward to the end of the war now, prospects are looking brighter at the battlefront, and when these boys are facing home instead of the enemy what will they meet if we have not subscribed to the limit, yea, beyond the limit? They will be facing a people whose faith was not such as would convince us that money must and always will be secondary to life; the one we can give, the other we cannot and live.

There are thousands in Canada that have the opinion that if the war is soon to come to an end that money will not be required. Such thoughts prove that those persons who think so have not given the question very much serious consideration. Just let us review the problem in even a very casual, yet plainly-expressed manner.

First let us assume that the war is over and that victory is assured our arms.

Second, let us assume that not another shell, bullet or piece of war material is to be made. What is the first thing that will have to be done? The quite logical reply would be, get the boys all home again. Certainly, and what will that mean? It will mean first that one-tenth of our population has to be carried over a stretch of land and water approximately 4,000 miles. It will mean that millions of dollars will be needed to do this work, and what if we have not subscribed and oversubscribed to this and future loans that are launched?

Here's a picture; 500,000 Canadian boys on the coast of Belgium and France calling for ships to carry them home and the government of our country replying: "No money, the folks out here think you can walk over, the war is over, Canada is safe, and we are through with you fellows." That is just what will happen if you, Mr. Reader, do not buy, yea borrow to buy, Victory Bonds.

Now let us not look on that weird picture; we know it will never mark the memory of any Canadian. We feel sure that every Canadian, if told just all about a country's bond and what it is, that no home will not possess one or more of each bond issue.

In plain words, any money a person may own may be invested we will say in a trust company. This company borrows money, or holds in trust your money and pays you an interest on it. No matter how strong that company may be, it cannot be stronger than the country in which it is doing business; and it is a private concern; Canada is a public concern, and the more money you loan to the government by buying bonds the greater and stronger is Canada. You add strength to your country when you loan money to it.

The strength of Britain was not and is not in her private financial trust companies, but rather in the fact that her people banked their money in the Post Office Savings Bank, the bank of the country. Look how long a period elapsed before Britain became a borrowing nation. Her working population piled up billions of pounds into the savings banks, and it should be the same in Canada.

Next we will suppose that all the money has been subscribed that was necessary to bring the boys back home, and they are here. What are we going to do with them? Not for them, because it is they who have done their bit for us. We can never repay that stupendous debt, and they are not even asking us either. That freeborn sturdy spirit, which is 90 per cent. of the total make-up of Canadian soldiers, will never ask for charity; they will scorn it, so we must be ready to do our fighting by preparing to meet a situation which will have to be met when the boys are here.



A number of delegates at the recent convention of American Society of Sanitary Engineers.

We do not want memorial halls, we want no marble shafts, we want no cold monuments to remind us of the dead, but we do want living memorials, we want to do something for the boys in return for what they have done for us. Then, like their sacrifices, let ours be practical.

There is one blight upon Britain and the British Empire as a whole that must not be repeated after this war. What did Britain do for the "Boys of the Light Brigade"? The writer well recalls seeing many a member of those gallant fellows who took part in the "charge" at

Balaclava being exhibited as worthy objects of charity, and as these lines are being written, the words of that song, old to every Englishman, is called to the mind of the writer:

"Like a hero he lived, yet a pauper he died,
For he was one of the Light Brigade,
One of those heroes true,
Wounded at Balaclava,
Fighting like Englishmen do;
Quite forgotten and left to die,
Now that his eyes are dim,
That's what he's done for England,
And England has done for him.

Begone such blights. We would not permit such to take place in Canada, neither will Britain have such history repeated. Those were dark days of the dark ages, and we must not dwell upon them, though it does no harm to recall such history, lest we forget.

What must we then do if we would build up or express practical appreciation for the work our boys have done?

The following clipping from an American paper will be of interest to every Canadian citizen, and no less to every sanitary engineer:

Secretary Lane Favors Project to Furnish Farms to Soldiers

KANSAS CITY, Mo., Oct. 18—A nation-wide movement to provide farms for the victorious American soldiers on their return from the battlefields is indorsed by Franklin K. Lane, Secretary of the Interior, in a telegram to the international farm congress, made public here to-day by delegates who are leaving for their homes following the forced adjournment of the congress yesterday on account of the ban against all public gatherings during the influenza epidemic.

Discussing the "far-reaching value and effect of your plan for making farms for returned soldiers," Secretary Lane's telegram continues:

"I shall look to your congress in the hope that you who are pioneers in reclamation work will give your approval to this new and greater adventure.

"The boys in France are thinking of two things—Berlin and home. They are determined to pass to the latter through the former. We want a guaranteed peace, and when our boys return we should have a job for each one. He can make his own home out of our unused lands."

Can we in Canada do less? Can we not get behind some such a scheme and make it possible for our boys to live this life without the sting? Can we not make him still a valuable citizen by seeing to it that he has a home over his head as long as he lives, free from the exploiting land owner and house speculator? We must. It is at least the duty of every Canadian to see to it that no one shall, from now on exploit the Canadian soldier. There's no charity in this, it is simply common decency. In conclusion let us see to it that this Victory Loan now being launched is oversubscribed double, yea more, and if all the subscriptions are not needed now they will be at a not far distant date. Let us all plan something and give vent to our thoughts in a practical way, and "Buy Victory Bonds till it hurts."

A Contemporary Gives Advice

Some Important Points Mentioned—Sanitary Engineers Will be Interested to Learn That Our Contemporary, "Contract Record," Makes Bold to Give Advice to Whom?—Architects We Assume

IT is refreshing to see someone take take up the cudgels in favor of the much maligned steamfitter or heating engineer. He is cussed and discussed more than enough by owners of heating plants because of the inefficiency of the plants installed. The fact is very few heating engineers have much to say as to what they would or would not consider to be a good job.

The manufacturer of boilers and radiation almost sleeps on the doorstep of an architect's office if there is any rumor of a job being to tender on. Plans are drawn free by the dozen on almost every job and by almost every manufacturer, and even the latter is very seldom asked for specific advice. No, the architect knows it all. Indirectly he has been and is responsible for 90 per cent. of the fuel that is being wasted. But there is still hope for the architect, particularly if he will be advised and take note of all such articles as the following which appeared in "Contract Record" recently.

There are one or two points with which we do not quite agree, but in the main it is good advice and makes good reading:

"Competent engineering advice should be obtained for important new installations or construction of heating systems, especially of piping work. In certain industries, textile mills for instance, where a large amount of piping is required poor design and arrangement is responsible for great losses. An instance is recalled of one mill that has lost $100,000 in waste of fuel in the last ten years for want of a good piping job.

In many heating and sprinkling installations the cost of piping will amount to 10 per cent. of the cost of the building. In some cases, such as dry rooms, this cost may be increased to 15 per cent. or over, of the building cost. In bleacheries, dye house and buildings of that nature the piping cost runs up considerably due to the large amount of piping and numerous valves that are used on the different machines.

The practice of sending plans of buildings to different contractors and asking for prices on complete guaranteed systems should, in the writer's opinion, not be encouraged. The highest bidder will quite likely have the best and most economical layout but it is possible that it will be rejected in favor of a competitor who puts in a lower bid for an inferior system.

The high pressure steam heating systems have become more or less obsolete and are replaced by low pressure installations with a vacuum in the return lines. The maintenance cost of a low pressure system is greatly reduced in comparison with the upkeep of a high pressure system on account of the reduction in valve trouble and the elimination of leaking joints. With the vacuum system, providing it is kept in good order, the coils will not become clogged and a room can be kept at an even temperature.

The points to be considered in the design of a heating system are:

1. The amount of radiation required and the most suitable location for the heating units. The location of the units will determine the style—whether a built up pipe coil or a radiator shall be used, also whether wall or ceiling radiators will have to be used.

2. Suitable size of feed lines.

3. Efficient traps.

4. Suitable size of return lines.

A vacuum of about ten inches will always keep the coils free from air and water. The return lines should always be piped so that the condensation will flow back to the pump return trap by gravity. Be sure to have a valve placed on this line near the pump so that the return water may be run off at any time if it should be necessary.

Ceiling coils are carried on hangers of various designs and wall coils are secured by wall brackets of numerous types. In placing hangers for ceiling coils be careful to see that the roof is not pierced, causing leaks.

All underground sprinkler mains and water service pipes are usually of cast iron when the larger sizes are used. The smaller service pipes, below three inches, should be of galvanizezd iron.

Steam pipes, when it is necessary to run them underground, are encased in cypress boxes or tile pipe.

Too much stress cannot be laid on the subject of properly attaching valves. A bad practice sometimes followed in screwing pipe and brass valves together is in using extra long pipe wrenches and placing them on the hexagon farthest from the pipe end which is being connected. When this is done, no matter how heavy the valve body may be, it will tend to spring the seat and place same out of line. In screwing on to pipe always close the valves tight, so as to make them as rigid as possible.

Piping should be cleaned out before being screwed into position and the line should be blown out after the valves are in place. Unless this is done loose scale or metal chips remaining in the pipes will injure the valve seats or discs, causing leaks and necessitating re-grinding, re-seating or removal of the discs. A valve should not be permitted to carry the weight of a line of piping as this may spring the seat. A properly placed hanger has often remedied the difficulty of a leaky valve.

Insist that the entire piping system is thoroughly inspected before it is accepted by you as there are few features of your equipment likely to cause more constant worry and continuous trouble than a poorly erected piping job.

The articles appearing in SANITARY ENGINEER entitled "Reasons for failures in heating systems," bear out our contention that architects, if they assume engineering responsibilities, should engage competent heating engineers themselves to take charge of such work.

There is such a thing as an architect client expecting too much, but on the other hand no person should tackle a job they know little about, and this applies to many heating engineers.

If every heating engineer was practical and understood the science of heating in every detail, coupled with the true art of salesmanship, the manufacturers of boilers and radiation too would leave the architect alone. There's much improvement to be made all round.

SANITARY ENGINEER

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TORONTO, CANADA

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VOL. XII. NOVEMBER 1, 1918 No. 21

STANDARDIZATION MUST COME

AT the recent convention of the American Society of Sanitary Engineers, a number of very important questions were brought up and to some extent the standardization of fittings came in for discussion. The main topic, however, was that of the recent resolutions passed by the War Industries Board at Washington, D.C. These will appear in SANITARY ENGINEER, November 15 issue.

We do not at this date propose to discuss these particular resolutions, but we do feel that any resolutions adopted over the line must have a certain bearing upon the trade here in Canada. Further, SANITARY ENGINEER is issuing a warning note to every society, to the extent that unless the trade make some definite move in the matter of standardization of fittings, piping and uniform code for plumbing installation, such work will at a later date be taken entirely out of their hands, or rather, men will be delegated to eliminate many standards that, by natural process have proved to be very essential.

One question first of all should be asked by every earnest member of the craft, and that question is: "What fittings can we dispense with without jeopardizing the high standards already established in our present installations?"

Next could be asked: "In what way does our local plumbing by-law differ from such and such a town's by-law, and what can be done to make the most of the plumbing by-laws more alike?"

Some start should be made and as the pages of SANITARY ENGINEER are open for any open and progressive discussion, why not start right now?

As a starter, we are going to ask a question, which question appears on another page; and we hope sincerely to have a large number of replies. As soon as a sufficient number of opinions have been expressed, we will ask another and so on.

Readers of SANITARY ENGINEER will be judged as to their earnestness and interest in their calling by the way these discussions are responded to. Let us not appear to be filled with the spirit of apathy, regarding such questions as are involved in this, one of the most essential professions under the sun.

ABOUT HEAT CONTROLLING

WE doubt verymuch if there is a more wasteful nation on the face of the earth than Canada. That sounds rather harsh does it not? But here is at least one fact tending to prove it—the wasting of fuel.

It may be that in the case of fuel we are not wasting per capita any more than most nations, but SANITARY ENGINEER believes we are. And this is the way we reason it out.

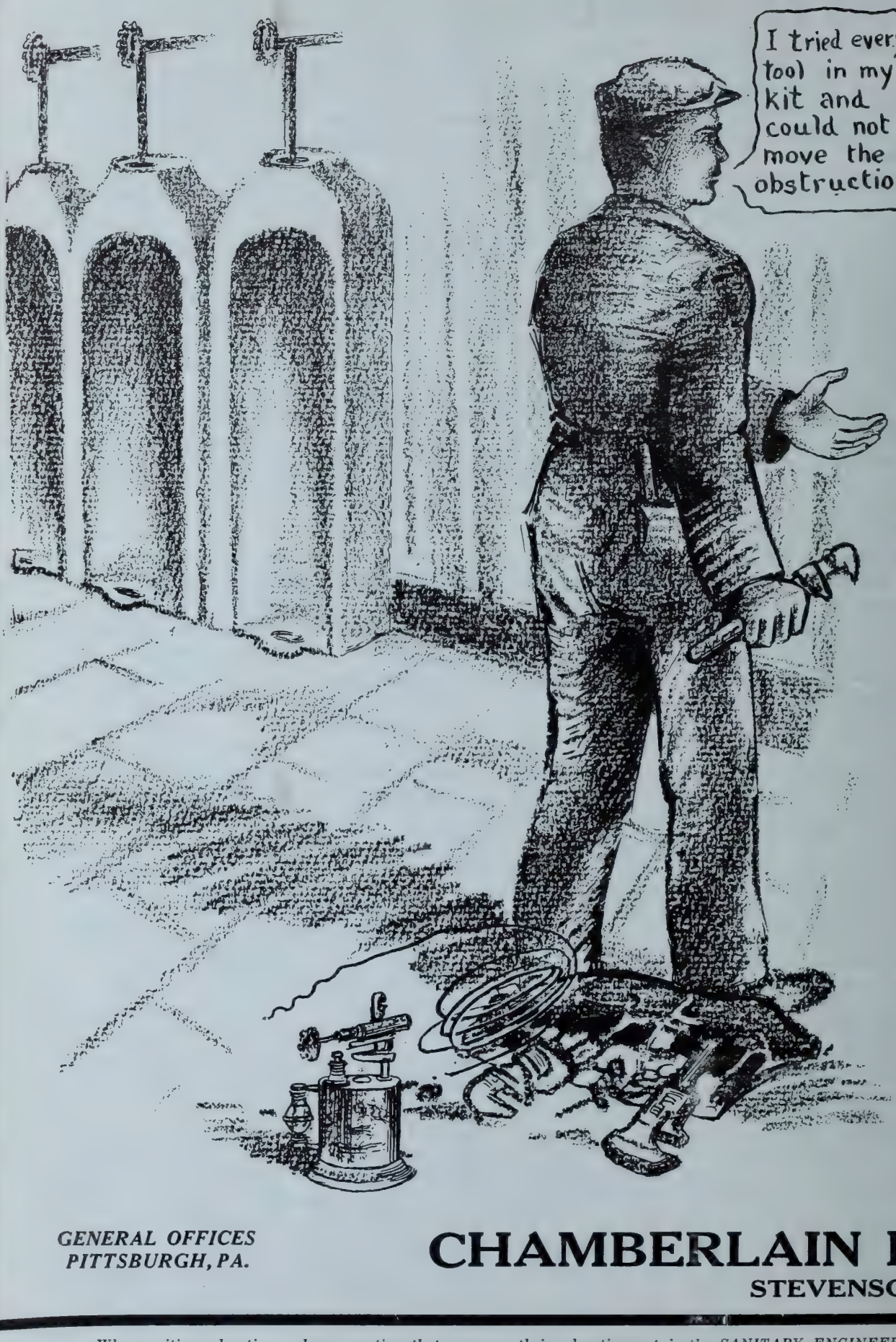
Because of our severe climate, we have to force furnace fires more than in a country where the winters are not so severe, and in so doing a lot of B.T.Us in unconsumed gasses escape up our chimneys. Next, we have up till now been very lax in our building regulations, homes particularly have been built by speculative builders merely for sale. No thought as to the upkeep of same or as to heat losses from radiation or convection has been given when such buildings have been erected, and as we have been rolling in luxuries, we have never dreamed of the fuel waste we were piling up.

Now, the question is this: Are we still going to allow fuel to be wasted because we are not sufficiently interested in properly equipping every furnace with some form of heat controlling device?

Coal is the most essential of all fuels, and always will be. It is out of the question to ever think that we will have electricity take its place economically. To prove this assertion we would call the attention of our readers to an article which appeared in SANITARY ENGINEER, October 1st issue entitled, "The Story of a Pound of Coal."

The fuel saving problem is in a sense one in which we sanitary and heating engineers can and should take more interest. We can do so in many ways. We can study the heat losses of a building and draw the attention of the builder, or even the Conservation Commission to every case where we believe there is likely to be an excessive loss of heat from any cause whatever. Next, we can see to it that every furnace is complete which is not the case if no heat controlling apparatus is attached to the furnace.

Every householder, every owner of buildings required to be heated is unconsciously defeating the good work of fuel conservation when he operates, or allows to be operated any heating plant not automatically controlled.



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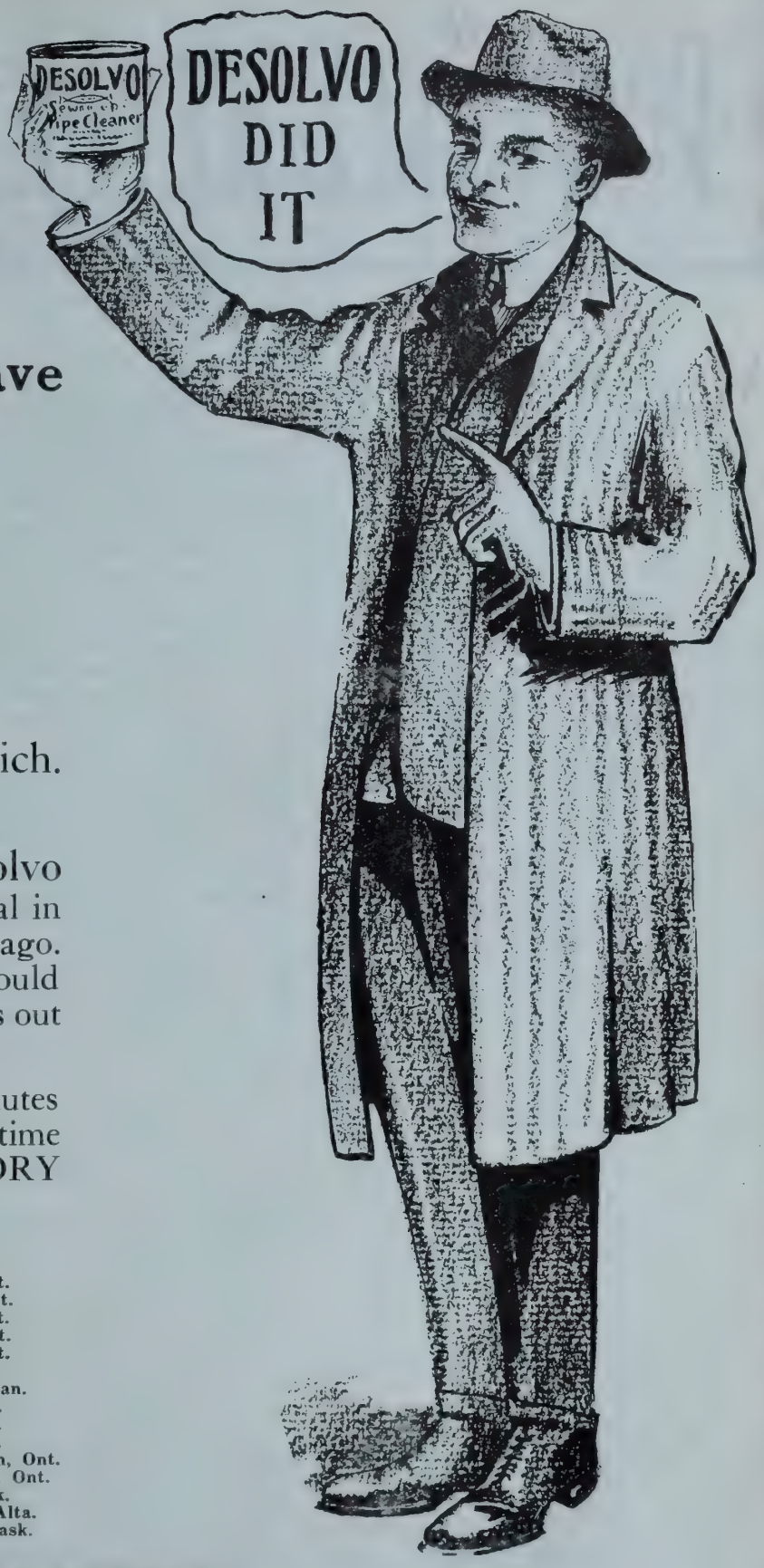
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GENERAL OFFICES
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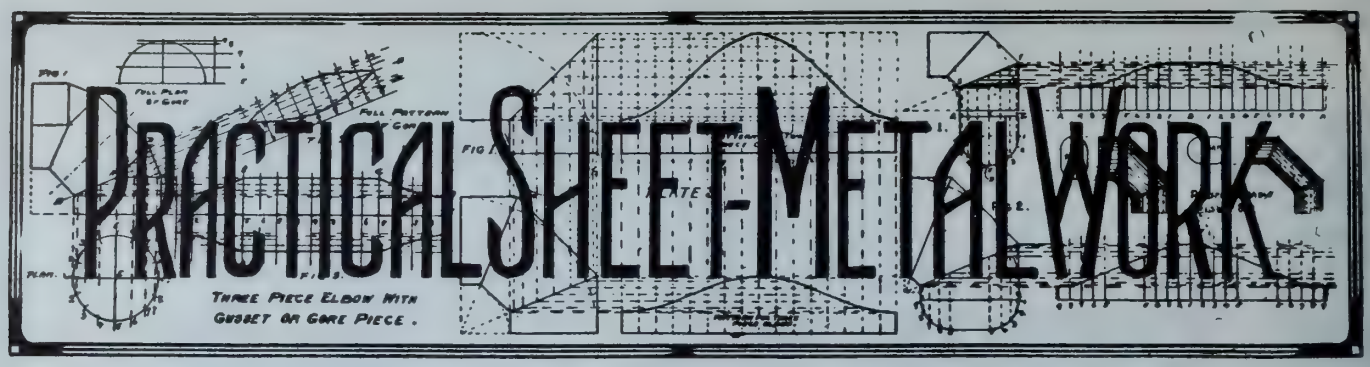
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so as to be better able to buy VICTORY

IST OF JOBBERS

ny	Toronto, Ont.
ny	London, Ont.
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	Winnipeg, Man.
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Co.	Fort William, Ont.
d.	Port Arthur, Ont.
y Co.	Regina, Sask.
	Edmonton, Alta.
	Saskatoon, Sask.

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BY THOMAS STANSFIELD

WHILE it must be admitted that many articles that are shown and patterns for which are described in almost all sheet metal courses, can be bought cheaper from the factory, it is nevertheless very essential that almost every conceivable article and its manner of making should receive some attention. The writer well remembers a certain sheet metal worker who was first class at pattern developing, though only very ordinary at real manual work, and eventually became die designer for a large factory turning out all manner of stamped articles, thus showing how essential it is to know how a thing can be made up by hand, even though the article can be "bought at the factory cheaper."

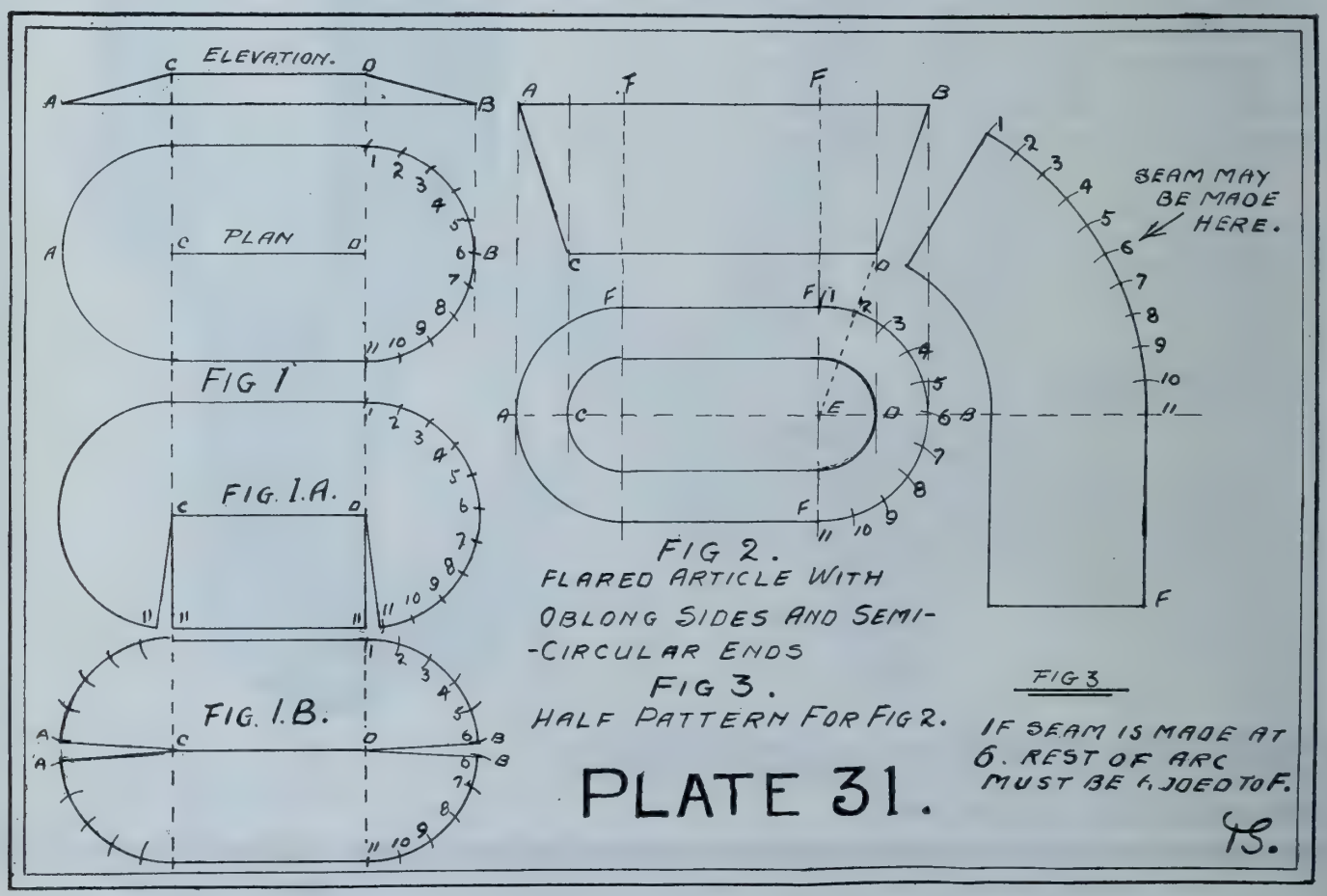
Plate 31 shows two articles, Fig. 1 and Fig. 2. Fig. 1 is a flared cover for a washing boiler; it is simply made and two methods are here given for making the seams.

Let A, B, C, D, in elevation, be the desired cover. Draw plan as shown from the elevation and divide the ends A and B into equal parts, 1, 2, 3, 4, etc. Next, with AC in elevation as radius and CD in Fig. 1A as centres, draw two semi-circles. Divide these off, using the measurements from plan, 1, 2, 3, 4, 5, 6, B, etc., until 11 is reached, which will show a slight shortage at 11. 11. This will give one method of making the pattern. Fig. 1 B shows how this cover can either be made in two pieces, or seamed at BB, AA. No allowance has been made for seams.

Fig. 2 shows elevation and plan of a flared boiler, with semi-circular ends. A B C D is elevation, from which the plan should be drawn. Having determined how much slope and depth is required, extend the sides AB and BD, as shown.

Now, with E as centre and E and D, respectively, as radii, draw two arcs, and divide them off, using the same measurements as used in plan 1, 2, 3, 4, etc., to 11. From 11 to F in Fig. 3, is shown the straight or flat side piece. If, however, the seam is made at point 6 in Fig. 3, the rest of the measurements from 1 to 6 must be added to that portion of pattern at F. This would make the seam come on ends directly opposite to each other. Very often these kind of articles are made with four seams, for two reasons. First, that smaller sheets of material can be used; second, if the locked seams are well made, they strengthen the sides considerably.

(Continued in next issue).

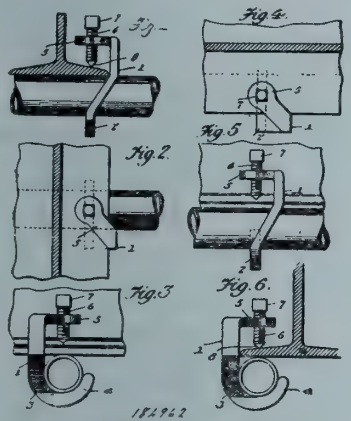


New Canadian Patents

No. 184,962.

Paul Lupke, Jr., Trenton, New Jersey, U.S.A., 18th June, 1918; 6 years. Filed 25th April, 1918. Receipt No. 294,181.

Claim.—1. In a pipe hanger comprising body portion, arms arranged at each end thereof and extending in relatively different lateral directions, one arm crossing the opposite arm, and means for securing the hanger in position.



No. 184,962. Pipe Hanger.

2. In a pipe hanger comprising a body portion, arms arranged at each end thereof and extending in relatively different lateral directions, one arm crossing the medial point of the opposite arm, and means for securing the hanger in position.

3. In a pipe hanger comprising a body portion, arms arranged at each end thereof and extending in relatively different lateral directions, one arm crossing the medial point of the opposite arm, and means associated with one arm for securing the hanger in position.

4. In a pipe hanger comprising a body portion, arms arranged at each end thereof and extending in relatively different lateral directions, one arm crossing the medial point of the opposite arm, and means associated with one arm in alignment with the medial point of said crossed arm for securing the hanger in position.

5 In a pipe hanger comprising a body portion, arms arranged at each end thereof and extending in relatively different lateral directions, and a set screw associated with one arm in alignment with the medial point of said crossed arm for securing the hanger in position.

6. A pipe hanger comprising a body portion of angular formation, arms arranged at the ends thereof and extending in such direction that one arm crosses the medial point of the other arm.

7. In a pipe hanger comprising a body portion one end of which is bent out of alignment, arms arranged at each end of the body portion and extending in such a direction that one arm overlaps the other, and means for securing the hanger in position.

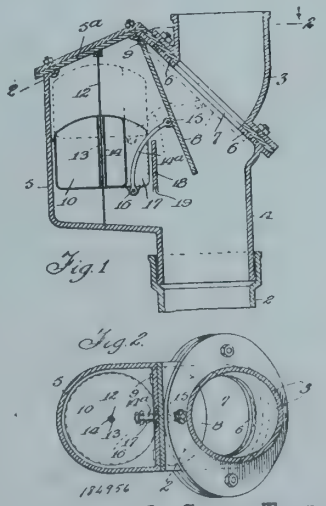
No. 184,956

Leon Jodvin, Montreal, Quebec, Canada, 18th June, 19188; 6 years. Filed 16th February, 1918. Receipt No. 291,038.

Claim.—1. In combination a sewer pipe, a pipe of waste clearance system communicating with a sewer pipe, a valve controlling the communication between pipe of clearance system and sewer pipe, a float controlling said valve and presenting a radial slot therein, and an arm pivoted at its opposite ends respectively to float and valve and having its intermediate position accommodated in said slot of the float, substantially as described.

2. In combination a sewer pipe, a pipe of a waste clearance system communicating with the sewer pipe, a valve controlling the communication between pipe of clearance system and sewer pipe, a float chamber open to the sewer pipe, a guide extending from top to bottom of said chamber, a float slidably mounted upon said guide and having a radial slot therein extending inwardly from the exterior thereof, and a rigid arm pivoted at its ends respectively to the under side of the float and valve, the intermediate portion of the arm being accommodated in said slot, substantially as described.

3. In combination a sewer pipe, a pipe of a waste clearance system, a pipe section joining said pipes and comprising a valve and a float chamber, the top of said valve chamber being downwardly inclined away from said float chamber and having the pipe of the clearance



No. 184,956. Sewer Trap.

system attached thereto and the bottom of the valve chamber having the sewer pipe attached thereto, a valve pivoted within and near the top of the valve chamber and adapted to extend over and close the opening between valve chamber and pipe of the clearance system, a guide rod extending between top and bottom of the float chamber, a float slidably mounted upon said guide, and a rigid arm pivoted at its ends respectively to the float and valve whereby movement of the float is communicated to the valve, substantially as described.

ORGANIZING SPENT STEAM

Every city has hundreds of exhaust pipes discharging steam into the air, says "Power," a waste from small industrial plants which might be stopped by a slight expenditure for pipe extension which would connect these hundreds and thousands of non-condensing engines to the heat system of adjoining properties, thus heating buildings with steam which is going to waste, permitting the shutting down of thousands of heating boilers, and the diversion of coal to power plants which urgently need it in the present crisis. "Power" favors what is termed the isolated block central station for the cheapest, most economical, and most convenient production of heat, light, and power. This idea has been developed to some extent in the larger cities, but never on the extensive co-operative lines which the present fuel crisis demands. In proof that such a system would pay, there are cited the central steam-heating plants in many cities and suburbs which generate steam for no other purpose than to supply heat to customers, not as a by-product, but as a commercial proposition, carrying satisfactory profit. Besides the convenience of such a system of steam-using customers, and the more economical burning of fuel at central stations, with non-fluctuating supplies of heating steam day and night during the winter, the isolated block plant would make unnecessary the large investment in small boilers and furnaces for office buildings, stores, residences, schools, churches and the like.

NEW PIPE TOOL CATALOGUE

A tool catalogue has just been issued by the Wells Brothers Company, Galt, Ontario, which contains some good information of use to every sanitary and heating engineer, apart from a full description of other lines.

The general information covers such subjects as drill sizes for pipe taps, Briggs' standard taper pipe threads and a comparison in British standard pipe threads, circumferences and areas of circles, etc. The book is of a handy pocket size.

Those desiring to procure a copy should drop a postal and ask for catalogue number 38.

Discussion on the Main House Trap*

Main House Trap Prevents Thorough Ventilation of Main Sewers—House Drain and Soil Pipe Stack Only Logical Way to Keep Atmosphere in Sewers and House Drains Free From Dangerous Gases—Several Sanitary Engineers Quoted Both for and Against

By EDWIN NEWSOME, Editor Sanitary Engineer

GENTLEMEN and fellow-members of the American Society of Sanitary Engineering:

I am not quite sure why the program committee allotted to me the duties of opening the discussion on the Main House Trap. We have so many who still hang onto its use, and still many more who cannot see any reason why such a fitting should be placed on a main house drain.

However, I do not think any of those gentlemen present are really desirous of getting me into hot water with any of my fellow craftsmen.

Those of you who were present at the last convention held in Grand Rapids will remember that I was asked to join in the discussion on main house traps last year. I have not very much more to add to what I said last year except from observations made and letters received from readers of SANITARY ENGINEER.

I doubt very much if there is a more interesting topic in connection with our profession than that of the main house trap. We are continually being asked whether the main house trap should or should not be dispensed with.

However, to begin with, we must assure ourselves of one or two things. Firstly, that all systems of drainage pipes or sewers are so constructed as to effectively and quickly convey all soil or waste matter, solids and fluids out and away from our buildings.

Secondly, that all such drainage and sewerage systems shall be effectively ventilated. We must also construct all piping or systems of sewers in such a way as to eliminate acute angles. We must build or install such piping free from obstructions.

Now, taking for granted what I have said, can any sanitary engineer feel assured that the main house trap is a sanitary fitting? It is, first of all, an obstruction. Its very title "Trap" proves that it is an obstruction. Very well. It also prevents the main sewers in our streets being ventilated, and is responsible for more choked house drains than anything else, excepting, of course, that of a tree root laden clay tile pipe. And then to further add to its insanitary responsibilities, the main house trap needs a breather, another abortion in sanitary engineering construction.

Now, what is the worst that can happen if the main house trap is dispensed with? Sewer air is said to have free access into the rooms of a building, particularly if the seal of a fixture trap is broken. But please note that I said "If the seal of a fixture trap is broken." Such a condition would not be likely to occur once to ten thousand traps installed.

Next, it is claimed that if plumbing is impractically installed, and a main house trap is fitted to the system, there is no likelihood of sewer gas entering a room or compartment in which a fixture is installed.

But we are not, or at least we should not be discussing abnormal as well as improper installations. We do not approve or recognize the work of the "botch." He requires eliminating no matter what we do with the main house trap.

We are trying to arrive at the proper answer, shall we endorse or condemn the use of a main house trap on a house drain? Assuming that the plumbing in the building is O. K.?

Allow me to quote what Dr. Hering, sanitary engineer expert, New York, said in regards to this question. He was, of course, referring to the most effective and sanitary method of sewer ventilation.

Said he: "If sewer air is being belched out of the manhole covers in our streets, it cannot be argued that these sewers are ventilated. The most effective system of ventilating sewers is through the soil pipe and vent stock. The air circulation is established by providing openings to the sewers from the street surfaces and opening to the house pipes above the roof of the buildings.

The house pipes are kept much cleaner, the slimy coating is largely removed and the escaping air above the roof is less odorous than when the house pipes are trapped against the street sewer. In fact, careful examinations made on this continent have proved that the air escaping through the roof terminal contained practically no disease germs."

Allow me to now read to you a number of abstracts taken from letters sent me in this connection from time to time by sanitary engineers from all parts of Canada.

Charles E. Good of Calgary, Alberta, said: "I am strongly in favor of dispensing with the main house trap and breather, because by so doing a free circulation of air is procured through the street sewer as well as the house drain."

J. J. O'Toole, Dartmouth, N.S., wrote me as follows:

"I think the main house trap and breather serves about the same purpose on a drainage system as the fifth wheel would on a wagon. It is being used because "Grandpa" used it, and also because some of our plumbing ordinances demand it. If the cost of same were applied to better brass goods inside the building there would be some good results procured."

W. R. Whitelaw, of Cobourg, Ontario, expressed his opinion regarding the main house trap in the following words:

"Yes, I think it much more sanitary to eliminate the main house trap and breather, so as to allow fresh air to enter the main sewer and permit it to flow continuously all the way through to the roof terminal."

T. J. Minnes, of Brantford, Ontario, said: "I do not favor the use of a main house trap any more than I would advocate the fifth wheel on a wagon, because neither are necessary to a modern system of plumbing."

And gentlemen, I could go on quoting the opinions of some of the best sanitary engineers in Canada, all of whom have the same opinion. It would not, however, be fair to lead you to believe that we have no champions for the main house trap. I will just quote one, though there were many who expressed their views in very forcible language, and I believe were themselves convinced of the need for the main house trap.

J. S. Kingston, Ottawa, stated that he was in favor of a trap and breather, "But," said he, "I consider that such should be outside the house, in a brick or concrete inspection chamber."

In conclusion, gentlemen, allow me to thank you very much for the patience you have shown in listening to my remarks on this much abused main house trap.

Continued in next issue.

*Being the opening address on main house problems, at the 13th annual convention of the American Society of Sanitary Engineering held in Chicago, Oct. 14, 15, 16, 1918.

TO USE EXHAUST STEAM FOR HEATING

The Toronto Terminals Company has applied to the Dominion Railway Board for the right to lay steam mains from the plant of the Toronto Electric Light to the new Union station, so as to enable the station to be heated by exhaust steam. It is said that this steam would otherwise be wasted, if not used in this way. The pipes will be embedded in concrete, and thoroughly insulated. They will be laid at a depth of about 10 feet.

Buy Bonds, Says President Charette

President Canadian Society Domestic Sanitary and Heating Engineers Heartily Approves Big Issue—Get Workmen to Sign Up—Make Early Estimate of Your Capacity to Buy—Be a Booster

THE first shot has been fired and the reverberating boom of the big guns has stirred enthusiasm in the breasts of Canada's patriotic plumbers. It is safe to say that the craft is a unit behind this biggest and best of all Canadian effort, for with pride has the trade arisen in this hour of opportunity to lend its unified assistance to putting over one of the most historic, patriotic, and the grandest accomplishments that young Canada has ever been permitted to launch. On with the effort; cease not; work overtime if need be. Carry your troubles out in the back yard and leave them there. Boost freely and fully that you may refer with pardonable pride, when you tell all your children and your grandchildren in the days to be of these wonderful times. Be prepared to tel. them what share grandpa had in doing that their honor might be preserved, their heritage perpetuated.

Hurrah for the President

It was the privilege of SANITARY ENGINEER to interview Mr. Alex. Charette a few days ago as to his views on the Victory Loan of 1918.

As president of the Canadian Society of Domestic Sanitary and Heating Engineers the craft will appreciate his sentiments on this timely occasion. In a nutshell he said, "My whole heart is in this movement, and when I say this I mean that all the money we can invest and all the time that we can give to this great loan will be given gladly, willingly. No effort is too great."

That is the spirit of the president. It will be welcomed far and wide as a true and patriotic message. Those who have been born and reared under Canada's free institutions, who have learned to value the great freedom afforded her every son and her every daughter, will stand up beside the president and say, "amen."

Think! Think! Think!

There is a danger when one has so many pressing needs—and who hasn't these days a host of them, of letting this appeal go by the board without the serious, careful, thoughtful planning it merits. Some will even be tempted to withdraw because their ability to subscribe is measured by the bonds of smaller denomination. That need be no barrier. Think! The honest effort of the small investor means more, perhaps, than the casual interest of the well-to-do who simply needs to tap his savings in the bank. It costs him little compared with the men who have to forego an extra pair of shoes, a few theatre tickets, or perhaps a week-end with a friend.

Think! Get your pencil out and figure a little. You have $50 or $100. Barring accidents you will have $25 or $50 per month that might go into your savings account at the bank. It might not even be chased that way. Can you save that amount? Can you change your ways and surely save it? Then put it into bonds. Think! Sit down and figure it out now—before the canvass man calls upon you, and be ready to give him an answer as to what you can do. Let him get on with his task—it is a big one.



A. Charette president Canadian Society of Domestic Sanitary and Heating Engineers

Those Over There

Lest we forget? The hardships at home, for many at least have been great. They have been hard to endure. Hearts have ached and many are still sore, but what is even the worst lot of those here as compared with that of the poor, unfortunate Belgian, the Frenchman, Serb or Italian? Think this over again. Our cause is a common one. What would the cash we have be worth in the bank did we not do the needful to keep the lads "over there." The country has been doing well by them—broadly speaking. It must do more. Its government was chosen to represent you. It is asking for your silver bullets and mine. Recognizing that what you lend must carry earning value, it has arranged to give it you. Your interest return is a good one; it is certain. With victory over the horizon there ought to be a clamoring for bonds that will pale previous effort and break all bounds. Cheer the lads on. "They are going strong," as Secretary Watson of the C. S. D. & H. E stated, "so strong that it's a hard pace to maintain. That is what they want. The readier the response at this time to the appeal of the Finance Minister, the greater speed the boys will feel prompted to make in Flanders. Send them over such a good report on the completion of the big drive as will reverberate again in all the Allied camp and send the boys onward to Berlin with the biggest push they ever had from home.

Cultivate Your Men

The Victory Loan committee has a mighty task to complete. It is going to mean days and nights of earnest, hard work. Someone is going the limit to make up for the laggard. What can the master plumber do? One may have one assistant in the shop or he may have twenty. They are good fellows. They are often free spenders. Because of this latter fact their employer may approach them on this very point and give them some good advice. Outline the advantages of investing in the bonds of Canada. They are gilt-edged as an investment and are tax free. The resources of the country are practically limitless. The purchase of bonds will stimulate thrift that may mean the turning point in one's methods. Having to have from month to month the necessary payments on maturing bonds will require that one cut out the unnecessary things—the non-essentials.

From the master plumber's standpoint he can spend some time to good advantage getting his men lined up to buy bonds. He can tell them to invest in their country. This will set them thinking; will give them a real interest in public matters—and every Canadian ought to have that. If you can succeed in giving your men a good tip in this way, one that will result in their buying Victory Bonds, you will have helped yourself, for you have probably started your men on the right road to thrift—and thrift must be developed among Canadians. There is a difference between thrift and niggardliness.

Be a Booster

The campaign is on everywhere. The craft is going to do its full share to make the effort the most successful ever. Think Victory Loan, talk Victory Loan, dream Victory Loan.

The last four years have been trying. The craft has stood the severe test of building inactivity a long time. It has lost heavily in the matter of restricted building, and even in the matter of usual repairs there has been a dearth of paying orders. The fall of the year has been active, but all this business has to be done within a few weeks, and the plumber has had take, in many cases, small pickings.

Victory is on the horizon, however, and there is reason to buckle belts a little tighter and go into this matter with all earnestness. Gather up the

(Continued on page 32)

Market Conditions and Tendencies

Statements Regarding the Prices and Trend of Supplies.

THE MARKETS AT A GLANCE

A LOWER price has been named on tin in some quarters amounting to 5c per pound. The market at the present time is comparatively quiet and whereas supplies are none too heavy, they are ample to take care of immediate requirements.

Lead is very tight. Supplies are being very largely absorbed in essential war industries with the result that commercially this metal is scarce. Although an agreed price is maintained for war enterprises, it is intimated premiums have to be paid to get deliveries for regular trade which may mean higher prices. The effect on manufactured products is to supply a firm undertone which may ultimately increase quotations. Spelter stocks which have been heavy have declined under influence of a fairly active demand and this has resulted in a stiffening of the market, though no quotable change is reported.

Manufacturers of soil pipe are all booked up with orders for some time ahead and it is indicated that it will be almost impossible to get prompt deliveries of orders from now on. The War Trade Board have drawn the line much tighter in regard to releasing raw materials and the scarcity of labor is an added factor which is curtailing production to a considerable extent.

A famine in sheets seems to be developing and there is no immediate relief in sight. Quotations show no change but there are few low priced sheets available. The outlook is for diminishing stocks and even higher prices would not be surprising.

TORONTO, October 29.—A further decline in tin is noticeable in some quarters, and a very firm situation has developed in respect to spelter. Sheets are increasingly scarce and prospects do not show improvement as had been hoped for. Solder is unchanged, while lead products rule very firmly.

Scarcity Sheets to Affect Range Boilers

RANGE BOILERS.—The marked scarcity of sheets is bound to be reflected in output of range boilers, and whereas so far the requirements of the trade have been taken care of, the outlook for the future has its serious side. No price changes are recorded but the market is very firm.

	Standard	Extra Heavy
30-gallon range boilers	$14.00	$17.00
35-gallon	17.00	20.50
40-gallon	20.50	24.00
52-gallon	28.00	32.00
66-gallon	37.00	42.00
82-gallon	45.00	50.00
100-gallon	62.00	70.00

Demand Improved; Tendencies Upward

ENAMELWARE.—A somewhat improved demand is noticeable though manufacturers and jobbers state that more business could be handled quite easily. Prices are unchanged but scarcity of raw materials and higher manufacturing costs are factors to provide a firming tendency.

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Basins, flat back, 14 x 15 in.	6 00
Do., corner, 15 in.	5 95
Sinks, roll rim, 18 x 30 in., staple	16 80
Closets, oak tank and seat	25 00
Do., enamel iron or white vitro tank	27 00

Soil Pipe Outlook Is No Better

SOIL PIPE, FITTINGS.—The outlook on soil pipe shows no improvement at all. Supplies are harder to get, the foundries releasing very little pig iron, with the result that production has been materially curtailed. The undertone to the market is decidedly firm at following discounts:

SOIL PIPE AND FITTINGS

Medium and extra heavy soil pipe, 2 in. to 6 in.	15%
Medium and extra heavy fittings, 2 in. to 6 in.	25%
8in. soil pipe and fittings	Net list

C. I. PIPE FITTINGS.

Cast iron fittings	Net List
Plugs	15%
Bushings	18%
Flange unions, standard	Net List
Dart unions, ¼-inch to 2-inch	15%
Do., 2½ in. and larger	6½%
Nipples, up to 4-inch	45%
Do., 4½-inch and larger	40%
Do., running thread 4-in. and under	25%
Couplings, 4-in. and under	35%
Do., 4½ in. and larger	15%

MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittgs., Class A, lb.	.60	.75
Do., Class B., lb. net	.27	.37
Do., Class C., lb. net	.19	.27

Prices Hold Steady on Valves

VALVES.—Prices have held at an unchanged basis from that recorded a couple of weeks ago. The market is firm and requirements of the trade generally being met quite satisfactorily.

	Discount off list
Ground work	42
Compression work, standard	47
High grade	41
Cushion work	40
Fuller work, standard	45
High grade	38
Basin cocks, No. 0 standard	40
Nos. 1 and 2	40
Bath cocks	50
Flatway stop and waste cock, standard	50
High grade	47
Roundway stop and waste cocks, standard	50
High grade	47
Brass steam cocks, standard add 10%.	
Globe, angle and check valves, standard.	Net
Do., removable seat	Add 5%
Radiator valves, standard	10
Do., removable seat	Net List
Patent quick opening valves	30
Basin Cocks—	
No. 0 and 1, Fuller pattern	45
Globe, angle and check valves, standard, medium pressure	20
Radiator valves, standard med. pressure.	30
Radiator valves, removable seat, medium pressure	25

Waste Firm; Oakum Steady

WASTE, OAKUM.—The market on waste is unchanged since last issue though undertone to the market is very strong. The outlook is for higher prices but these are not expected for another month or so. Oakum is steady with a very good demand reported and orders being despatched quite promptly.

	Per 100 lbs.
Best American	$21 00-$22 00
Clipper, spun	- 21 00
Do., unspun	- 10 50
Plumbers', spun	10 00- 10 50

Wrought Pipe Outlook Unchanged

WROUGHT PIPE.—Wrought pipe is very firm and unchanged. Manufacturing troubles are many, shortage of raw materials being a factor which is only aggravated by scarcity of labor. Prices appear in panel herewith:

WROUGHT IRON.
Price List No. 37—September 11, 1918

Standard Buttweld

	Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
⅛ in.	$ 6 00	$ 8 00	$.....	$.....
¼ in.	5 22	7 35	5 52	7 65
⅜ in.	5 22	7 35	5 52	7 65
½ in.	6 63	8 20	7 06	8 71
¾ in.	8 40	10 52	8 97	11 09
1 in.	12 41	15 56	13 26	16 41
1¼ in.	16 79	21 05	17 94	22 20
1½ in.	20 08	25 16	21 45	26 54
2 in.	27 01	33 86	28 86	35 71
2½ in.	43 29	54 11	.....	.....
3 in.	56 51	70 76	.....	.....
3½ in.	71 76	88 78	.....	.....
4 in.	85 02	105 19	.....	.....

Standard Lapweld

	Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
2 in.	$ 31 82	$38 30	$33 70	$40 20
2 ½in.	47 97	58 21	50 90	61 10
3 in.	62 73	76 12	66 66	79 90
3½ in.	78 20	96 14	82 80	100 00
4 in.	92 65	114 00	98 10	119 00
4½ iu.	112 00	137 00	125 00	149 00
5 in.	130 00	159 00	145 00	174 00
6 in.	169 00	206 00	188 00	226 00
7 in.	219 00	268 00	243 00	292 00
8L in.	230 00	281 00	255 00	306 00
8 in.	265 00	324 00	294 00	353 00
9 in.	317 00	388 00	.....	.....
10 L in.	294 00	360 00	326 00	392 00
10 in.	379 00	464 00	420 00	505 00

Terms 2% 30 days, approved credit.
Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Hard to Secure Stocks Boiler Tubes

BOILER TUBES.—Dealers are finding it hard to keep up an assorted stock of tubes. Especially is this so in the smaller sizes. In pre-war days a dealer kept a standing order at the mills for perhaps 100 tons assorted per month. The mill knew just about how to mix them for lengths and sizes, and went pretty much on their own initiative in keeping the stock up. But since the war programme has such preference in almost everything now, all these arrangements have ceased to exist, and as a result it is not an uncommon thing for warehouses to find that they are out of certain lines almost continually.

BOILER TUBES—	Cold Drawn	Lapweld
1 inch	$36 00	$.....
1¼ inch	40 00	.....
1½ inch	43 00	36 00
1¾ inch	43 00	36 00
2 inch	50 00	36 00
2¼ inch	53 00	38 50
2½ inch	55 00	42 00
3 inch	64 00	50 00
3¼ inch	.....	58 00
3½ inch	77 00	60 00
4 inch	90 00	75 00

Situation in Sheets Is No Better

SHEETS, PLATES.—The situation is no better—the feeling prevails that it can't be much worse. There have been some shipments of sheets reaching Toronto this week, but they are not in keeping with the business booked against them. Galvanized sheets that are being delivered now are selling for $11 up, mostly up. As a matter of fact the $11 figure does not exist now as a selling mark, and prices are running at $12 and $12.50. Peace talk has had no effect on the calls that are made on the material. There is a fair amount of the lighter sizes in plate still on hand in Toronto, but for the heavier sorts the scarcity is felt. Ottawa does not sanction extension to plants, even for the production of munitions, but will grant permits for material that is required for the upkeep or repair of existing plants, with a view to keeping production up in size and quality.

BLACK SHEETS—	Per 100 lbs.		
10 gauge	$.....	$10 00	$.....
12 gauge	.....	9 60	.....
14 gauge	.....	8 40	8 90
16 gauge	.....	8 50	8 55
18-20 gauge	8 05	8 30	8 80
22-24 gauge	8 10	8 35	8 85
26 gauge	8 15	8 40	8 90
28 gauge	.....	8 50	9 00
3-16 inch plate	.....	10 00	.....
¼ inch boiler plate	.....	10 00	.....

Prices shown are for full cases. An extra charge of from 25c to $1 per 100 lbs. is made for less than case lots.

GALVANIZED SHEETS—			
10¾ oz.	$11 00	$12 00	$12 75
U.S. 28	10 70	11 70	12 50
U.S. 26		10 40	11 40
22 and 24		10 25	11 25
18 and 20		10 10	11 10
16		9 95	10 95
14		9 85	10 85

Prices shown are for full cases. An extra charge of from 25c to $1 per 100 lbs. is made for less than case lots.

Solder Unchanged; Lead Products Firm

ZINC AND LEAD PRODUCTS.—The market on solder is without any particular feature. There is a slightly easier price on tin being made, but as yet this has not exerted any influence on solder. Manufactured lead products are firm, the difficulty in securing pig lead being a factor to uphold prices. The demand on all lines shows a slight improvement after a couple of weeks of rather quiet trading.

Lead pipe, lb.	....	0 15
Lead waste pipe, lb.	....	0 16
Lead traps and bends	....	Net list
Lead wool, lb.	0 14	0 15
Lead sheets, 3 to 3½ lbs. sq. ft., lb.	0 14¼	0 15
Lead sheets, 4 to 8 lbs. sq. ft.	0 13½	0 14
Cut sheets, ¾c. lb. extra and cut sheets to size, 1c. lb. extra.		
Solder, guaranteed, lb.	0 50	0 55
Solder, strictly, lb.	0 47	0 52
Solder, commercial, lb.	0 42	0 45
Solder, wiping, lb.	0 40½	0 50
Solder, wire, lb.	0 56	0 70
Zinc sheets, per lb.	....	0 26

Old Materials Virtually Stagnant

OLD MATERIALS.—Peace talk is to blame according to one dealer for present stagnant conditions in the markets. According to this dealer there had been a very acute falling off in the week after the first real peace talk had come to the surface. As a matter of fact there has not been the call for scrap for some time that has existed across the line. The prices that are quoted now are nominal in many cases, the dealers state. They are not keen to buy at the figures given because they have no place in sight now to dispose of the material, and they are not inclined to stock up their yards under these conditions.

Dealers' Buying Prices		
Tea lead	$0 05¼	$....
Heavy lead pipe	....	0 08
Yellow brass	0 12	0 13
Red brass	....	0 21
Light brass	....	0 09½
Heavy zinc	0 05½	0 06
Heavy copper	0 22	0 23
Stove plate, per ton	....	25 00
Old cast iron, per ton	....	30 00

Tin a Little Lower; Lead Tight

INGOT METALS.—A lower price is noticeable in tin in some quarters though supplies generally are not considered any too plentiful. Lead is in none too good supply and quotations rule with a firm undertone. Spelter has firmed up though prices are unchanged.

COPPER.—There is little of particular interest in this market. Supplies continue to go into war work and there is little to report commercially. Locally prices are firm and unchanged at 30c to 32c per pound.

TIN.—Lower prices are in evidence on this metal in some quarters which has served to widen the range somewhat. Quotations are now being made as low as 85c, and go as high as $1 per pound. Supplies generally are none too heavy but as the market is quiet there is ample for present demands.

SPELTER.—The market has firmed up as a result of better demand. Local supplies have been heavy, but this condition is largely overcome now and stocks are none too heavy. Quotations are firm though unchanged at 11c per pound.

LEAD.—The market is very tight. Practically the entire production is being absorbed in war work and this leaves commercial users in a position of uncertainty as regards getting any deliveries. Nominally quotations range around 10½ to 11c per pound, but this may stiffen slightly as it is said premiums have to be paid to secure supplies for other than essential war industries.

ALUMINUM.—There is no feature of interest in this metal. Supplies go into government work and quotation of 50c per pound can only be termed nominal.

ANTIMONY.—The market is quiet. The demand is light and interest lacking. Ample supplies are available to meet requirements and price has declined to 17c per pound.

PIG IRON.—Government demands for iron and more iron are insistent, with the result that production of pig is largely going to essential war industries of one type or another. The line on commercial enterprises is drawn more tightly every week, it seems.



JNO. C. KIRKWOOD ADDRESS POSTPONED

On account of the "Spanish flu" epidemic, the address which was to have been delivered on October 16, in the Canadian Foresters' Hall, Toronto, was postponed until a later date. The programme will be carried out, and the address entitled "Co-operative Advertising," will be given at a future date, full information as to date, etc., will be announced in the pages of SANITARY ENGINEER.

UNDER THE WEATHER

The friends of Bert McLaren, representative of the Galt Brass Co., will regret to hear that he is suffering from an attack of la grippe and at present is laid up at the Queen's Hotel, Halifax, N.S.

We have learned, however, that he is on the recovery side of the attack. We wished to advise his friends that all being well they will have a chance of looking into his happy, smiling face at no far distant date.

This item is particularly for Bert's Ontario friends.

The many friends of R. J. McAulay of W. J. McGuire and Co., plumbers, Montreal, will regret to learn that he has not been well of late and that he has been away from his desk for a time. Latest reports to SANITARY ENGINEER indicate improvement, however, and it is hoped that he will soon be able to resume his duties.

INVESTS ENDOWMENT FUND IN VICTORY BONDS

We have learned from good authority that the whole of the endowment funds of the Ontario Society of Domestic Sanitary and Heating Engineers are to be invested in the Victory Loan. This society is to be highly congratulated on this move they have made.

PLUMBERS DID NOT CLOSE

While most businesses have been compelled to open late and close not later than 7 p.m. in Montreal while the influenza epidemic is running its course, the plumbers have been more favored. In the very nature of their work, plumbers have been considered as outside the ruling of the health authorities and the Civic Health Department has so decreed. Called out at any time, plumbers are at the beck and call of the public and the present restricted hours have therefore not been any stumbling block to the craft here.

VICTIMS OF THE "FLU"

We regret very much to have to report that quite a number of members of the sanitary and heating trade have been afflicted with the Spanish influenza. One member passed on in the person of Geo. W. Richardson, 195 West Adelaide St., Toronto. He was, without doubt, one of the coming men, a hard, honest and practical worker, doing a high class jobbing plumbing business. He was an Old Countryman and knew the business from A to Z, and was well liked by all with whom he did business.

The sad part of this case is that for a number of years Mr. Richardson had had quite a lot of sickness in his family, but the outlook was just beginning to appear a little brighter.

SANITARY ENGINEER wishes to join the many friends of Bro. Richardson in extending their heartfelt sympathy to those of his loved ones left behind.

We regret to report the passing on of Elias C. Hill, sanitary engineer, Toronto. Mr. Hill was in business for a number of years in Toronto, having an establishment on Lansdowne Ave. He later went to St. Catharines and was employed for a number of years by Messrs. E. C. Gourlay Co. and was a splendid mechanic. Last August Mr. Hill came back to Toronto and established another business on his own account. SANITARY ENGINEER joins the many friends of the late Bro. Hill in extending their heartfelt sympathy to those who have been left behind to mourn his loss.

LOSES GOOD MAN

We regret to announce the death of Mr. George Sligo of the Ruud Manufacturing Company, which occurred October 11th, 1918, from pneumonia.

Mr. Sligo represented the Ruud Manufacturing Company's interests in the middle South for more than five years.

ON FAIR WAY TO RECOVERY

The friends of A. H. Read, sanitary and heating engineer, Shaw St., Toronto, will be pleased to learn that he is now on a fair way to convalescence. Mr. Read, we learn, has had a pretty tough fight, and we wish him a speedy and permanent recovery.

BOILER DAMAGED AT CARLTON SCHOOL, TORONTO

In spite of all the precautions taken as a general rule in regard to steam boilers, considerable damage was done recently to the boilers in connection with the heating plant at the Carlton School, Toronto. It appears from evidence submitted by C. J. Doughty, the sanitary and heating engineer of the Board of Education, at an inquiry into the Building Department of the Toronto Board of Education, that the fireman in charge, although the holder of stationary engineer's certificate, placed a fire under the boilers before first ascertaining that they contained water.

Mr. Justice Lennox suggested that an explosion might have caused a serious loss of life. The evidence was to the effect that the boiler itself was dry, with a fire going. Such a condition could not result in an explosion, it was pointed out, but of course damage was done to the boiler.

MONTREAL PLUMBERS ARE BUSY

A splendid spirit is manifest among members of the craft in Montreal these days. Business is good. It is very good indeed, and the difficulty now is that of securing the essential help and in obtaining all the material needed to complete the work in hand.

SANITARY ENGINEER believes that a desirable change for the better is already looming up in the offing. It is early to expect great things, it is unwise to be over optimistic, but work has been left undone for so long that this must now be overtaken. The plumber has waited patiently and is entitled to a new order of things. It will come as surely as peace will come, and its coming will be gauged by the readjustment that must shortly be engaging the attention of the Allied heads.

Already the master plumbers here are having difficulty in overtaking the work offered. This is mostly that of repairs, but quite a considerable amount of jobbing has been taken on. One large firm stated to SANITARY ENGINEER that they had had to decline work totalling several thousands of dollars, and that this very work would probably have to

rest for the time being because all are busy. Another stated that he had some eighty jobs ahead and that he was working hard to overtake them. Others again reported that they are working night and day and still the orders accumulate.

One of the most serious labor shortages that ever existed manifests itself to-day in plumbing circles. This has become more acute within recent months. The big railway companies, munition makers and others requiring skilled mechanics, have made tempting offers. The men have been offered more money than they were receiving, and even though the new job was likely to be one of shorter duration they frequently left. Some of them may have reason to regret their action, but that does not help the trade to-day. There is a general shortage and most shops could use several more men to good advantage.

There is a better spirit manifest in many ways. The war is going to be won and won decisively. There is every reason for the spirit that anticipates a forward movement. The plumber is coming into his own again and he is entitled to the most prosperous period he has had for many a day. It is time now to do some planning. Get ready for the times ahead. They will appeal to the man who is ready, and he will reap the profit.

ASSOCIATION OF BUILDERS FORMED

An important gathering of builders, contractors and supply men from all over Canada was held in Ottawa, on October 22, 23 and 24, for the purpose of organizing "The Canadian Association of Building Industries." The object of this body will be to discuss various problems arising out of war conditions, and others that will arise on the approach of peace. Among the questions the association will take up are the possibility of a restriction in the supply of building materials, as in the United States; the need for unifying and codifying the various acts in force in the different provinces in connection with workmen's compensation; the need for a uniform system of building by-laws all over Canada; labor conditions; industrial housing, etc.

Conference at Ottawa

The decision to hold this gathering followed a conference of a number of contractors at Ottawa in the early part of October. This was limited to men from Eastern Canada, but Western contractors have been communicated with and the response has been very promising. It is the intention to establish a permanent office in Ottawa, so as to keep the members in touch with the different departments of the government.

The officers of the convention committee were: J. P. Anglin, president of the Montreal Builders' Exchange; George Crain, Ottawa, treasurer; D. K. Trotter, secretary of the Montreal Exchange, secretary. Others who were present at the conference were: W. E. Dillon, president of the Toronto Builders' Exchange; A. H. Dancey, George E. Stacker and Harry Hayman, London; G. A. Grain, W. A. Mattice and T. D. McFarlane, Ottawa.

A similar movement has been started in the United States, peculiarly enough independently and unknown to the Canadian organization. The U. S. movement was begun by the United States Chamber of Commerce, and the meeting will be held in Chicago in November to perfect the organization.

EVERYBODY MUST SUBSCRIBE

Both the employer and the mechanic have a special interest in the success of the Victory Loan. In common with all other loyal citizens they are vitally interested in the success of our army in the field. The Victory Loan is absolutely necessary in order that it may be maintained at the highest state of efficiency and that complete victory may be assured. A patched up peace will not do. Germany must be brought to her knees, which means that no effort must be spared to do this.

The war is costing Canada to-day more than ever before. The Dominion's war bill last year was $320,000,000. The cost is now running at the rate of over $1,000,000 a day and it is expected that the total bill for this year will amount to fully $400,000,000, so there is need for every dollar of the $500,000,000 asked for. Even if peace were to come at once the Victory Loan would be needed, for it would take over a year to demobilize the Canadian troops.

The employer and mechanic are also vitally interested in the Loan from the standpoint of the business welfare of the country. The wonderful business activity of the last year has been due very largely to the $400,000,000 subscribed to the Victory Loan of last year. The Imperial Munitions Board, which has placed over $1,300,000,000 worth of war orders in Canada, is receiving advances of $25,000,000 a month from the Dominion Government. In turn the Government gets its funds chiefly through the war loans. Canada can get all the war orders she can handle, but she must finance them, and it is here that the Victory Loan comes in.

Every dollar counts. The money of the employer and mechanic is just as much needed as that of the millionaire. Indeed 1,000,000 subscribers are wanted, if the $500,000,000 required are to be secured. The money must be secured, everything depends upon it, business at home as well as the war.

NEW PLUMBING BY-LAW SOON READY FOR MONTREAL

SANITARY ENGINEER is informed that the plumbing by-law which has been under consideration for Montreal for some considerable time is already in shape for the consideration of the legal department of the civic administration. The amendments and all particulars have been carefully considered by the sanitary department, and when the legal department has made its scrutiny of the by-law, the same will be passed on to the council. This will take some weeks yet, but Mr. Cousineau informed SANITARY ENGINEER a few days ago that he anticipated that the by-law would be ready for final passing by January or February. This would make its workings applicable to the busy Spring season of 1919.

1919 PLUMBERS' CONVENTION COMING WELL

There is every reason to look for a bumper convention next June. The Canadian Society of Domestic Sanitary and Heating Engineers is going into matters early and intend that there shall be nothing left undone to make the forthcoming assembly the best ever.

Secretary John Watson told SANITARY ENGINEER last week that he was receiving encouraging replies from members at a distance regarding the proposed convention. He also said that he would like to hear from others. The fact that so many are busy at this time has probably prevented their writing in sooner to voice their sentiments, but he is looking forward hopefully to replies to the letters sent out to members recently. These replies should designate the attitude of the various sub-societies, through their secretaries, so that the general executive may work out a schedule of the questions that may properly be discussed.

There are many large issues that ought to receive the attention of the Canadian Plumbers and Heating Engineers. In view of the fact that conditions have worked against the holding of an annual convention for the last year or two, the proposed convention of 1919 should be a hummer. The war is nearer an end than it was. The building boom is sure to come, and the trade must be ready to take its place in the development that is bound to occur.

A representative master plumber stated to SANITARY ENGINEER the other day that there was sometimes too narrow an outlook on the larger issues that ought to occupy the attention of the trade. There was often too much pettiness. It would be well, he said, if this were dropped and the bigger things given the attention they ought to have. There is no place where that larger, broader vision can be secured than right in the convention hall. It is a time to renew acquaintance, but it is far more than this, a time to get the other fellow's viewpoint. It is the best experience in the world to know what your brother plumber is doing, what problems he has had to face, and how he has solved them. Therefore boost for this convention—your convention. It is not too early to do so. SANITARY ENGINEER is glad to open its columns to the big measures that will be discussed. Think over the problems that are confronting you and how you are meeting them. Be ready to come to the convention and engage in constructive discussion. It will do all members good to meet again.

Buy Victory Bonds or Earn Hunnish Bondage?

BONDAGE or bonds—which shall it be?
Chains of the Huns, or the gift of the free?
Heel of the Hell hound or Canada's grant ?
Where all may see it our Union Jack plant.
Turn a deaf ear to the whining peace trash.
Answer the Kaiser with bond buying cash.
We have loaned billions and more we must lend.
If the damned German will we would bend.
Shame on the man whose own loyalty brags.
Who then in Victory Bond buying lags.

Once let the Hun reach this land with his blight—
To fortune and freedom and business, GOOD-NIGHT.
Max and the Kaiser are playing the game.
Are we so dense, we'll fall for the same?
Never, thrice never! We'll stand for our own—
By putting across the big Victory Loan.
Question yourself, "Has my duty been done?
Have I bought Bonds as I should, or but one?"
If you have lagged, hang your head in disgust.
And raise it not up to the world till you're "bust."
If this five hundred million we Canucks don't raise,
It will put Kaiser Bill in good humor for days.
Germ-huns will roar, and the junkers will yell
At the way we Canucks for their peace buncombe fell.

"Over there"—will they cheer us or sneer,
If with our money we're tight over here?"
Bondage or Bonds—which shall it be,
Chains of the Kaiser or gifts of the free?

BUY VICTORY BONDS



Compression Sink Bibbs

SIMPLE elegance, combined with superior strength and wearing quality, is what you give your customer when you install **MUELLER** goods.

The many advantageous features of **MUELLER** compression bibbs give maximum service from the bibb as a whole. The anti-spreading device that breaks up the whirling motion of the water and the corrugated stem and handle, allowing the handle to be set at any angle without becoming loose or wobbly, are only two of these features.

MUELLER Bibbs are the best the market affords. Write for prices.

Buy Victory Bonds to the Limit, and "Then Some"

H. Mueller Mfg. Co., Limited

SARNIA CANADA

MUELLER

BUY BONDS FREELY SAYS PRESIDENT CHARETTE

Continued from page 25

fragments and use them wisely. Give this big effort every ounce of energy you can and let it be known that the plumbing trade of Canada has done its full quota. In President Charette's words, "put your whole being into it, heart and soul."

Other Officers Approve

Secretary John Watson is a warm advocate of the big loan. He has invested before. His noble son, still in the firing line in Flanders has also pinned his faith to the Homeland by having "dad" invest for him while he does duty "over there." To SANITARY ENGINEER Mr. Watson stated that all should do what was possible. The demands these days were heavy for living and so on, but the loan must be subscribed to as liberally as possible. He felt that the members of the craft would do well by this latest big effort.

James Griffin, another officer of the society is strong for the war loan. He had already subscribed to the loan of 1917 and would give his assistance to this one. It was but right that all should help according to their ability. Savings accounts ought to be used in this way, where possible, and every effort made that one could put forth. W. R. J. Hughes, of the Canadian society also feels that one should do all possible in subscribing as liberally as possible. Do your bit well!

THE HONOR FLAG

One hundred and fifteen tons of printed matter comprising 35,000,000 pieces prepared by a staff of some 40,000 workers and sent in small lots to every city, town, village, hamlet and wayside inn throughout Canada, in a period little longer than three months, is the task accomplished by the Dominion Publicity Committee of the Victory Loan campaign, 1918.

Posters measuring 24 feet by 10 will speak to Canada's 8,000,000 people from the bill boards of every city and town, and this is but one of innumerable schemes for reaching the purposes of the campaign. There is to be keen competition for honor flags this time. Aside from the sentiment attached to it, a 1918 honor flag is indeed a thing of beauty. It bears five bars, one for each war loan and will be given by the Governor-General, the Duke of Devonshire, to the towns, villages and cities exceeding their quota.

In the business houses and factories of Canada there will be honor emblems when 75 per cent. of the employees have purchased bonds. As that figure is increased stickers showing 85 per cent., 90 per cent. or 100 per cent. will be attached.

SUBSTITUTE FOR TIN BOXES

Pasteboard boxes are being manufactured in Denmark under the name "Metaloid" and used as a substitute for tin boxes. The manufacturers expect to make boxes of this sort suitable for the packing of all kinds of vegetables, fruits, fish, etc. Boxes recently received were intended for the packing of shoe polish and were lined one with tin foil and one with lead foil.

NO TIME TO LET UP

"Recent events have enhanced, not lessened, the importance of this loan and I hope that my fellow countrymen will let me say this to them very frankly; the very best thing that could happen would be that the loan should not only be fully subscribed, but very greatly over-subscribed. We are in the middle of the greatest exercise of the power of this country that has ever been witnessed, or forecast, and a single day of relaxation in that effort would be of tragical damage alike to ourselves and to the rest of the world. Nothing has happened that makes it safe or possible to do anything but push our effort to the utmost. The time is critical and the answer must be complete."—President Wilson.

QUESTION NO. 1 FOR DISCUSSION

We Want Everyone's Opinion.

What Objections Are There to Using One Soil Pipe Stack and Main House Drain For a Double House Where Same Can be Installed in the Dividing Wall, and Bathrooms Are Side by Side?

Williams'

Superior Drop-Forged Wrenches

For All Purposes



40 Standard Patterns —1,000 Sizes

Ask for Booklet—It's Free

J. H. WILLIAMS & CO.

"The Wrench People"

77 Richards St., Brooklyn, N.Y.

The A. G. Low Co., Ltd.,
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Agents for Manitoba, Saskatchewan, Alberta and British Columbia



M. & T. COILS EXTENDED SURFACE

Our Coils are not simply cored castings, but are specially designed to heat water with less effort and using less fuel. The extended surfaces and special tappings make the M and T Coils the most efficient on the market.

McIntyre & Taylor Limited

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MONTREAL
55 St. Francis-Xavier St.

WINNIPEG
322 McIntyre Block

Things are happening to-day. The vaunted power of the Hun is on the eve of being shattered. He is trying to strike a bargain. But —we mean to make victory sure. Be strong.

Thunder an answer that will make the Kaiser cower in fear. Get ready to lend.

BUY BONDS!

James Morrison Brass Mfg. Co., Limited
93-97 ADELAIDE STREET WEST, TORONTO



Our War and We Must Win It

Canadian vessels have been destroyed, Canadian soldiers and sailors killed and captured, and our casualty lists are being published, yet in the face of this many of us go on from day to day, living in an atmosphere of smug peace, making the war effort that comes to us, that is forced upon us, even as if we refused to realize that **this IS our war and we must help to win it.**

JENKINS BROS.
LIMITED

Agencies in all the Principal Countries of the World.

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EUROPEAN BRANCH:
6 Great Queen Street
Kingsway, London, W.C. 2
England



Be Sure to Put This In



The Dunham Radiator Trap

On every new installation—and every change-over job—give serious consideration to the kind of trap you put in, for your prestige after the war will depend largely on how helpful you have been in these times of fuel shortage.

Put in the coal-saving Dunham Radiator Trap—the trap that is now being installed in many of the Dominion's largest offices, factories, homes and apartment houses. Architects everywhere recommend it.

The Dunham Radiator Trap is simple—just a body, a cover and a thermostatic disc. It is made with special roughing-in measurements for replacing imitating devices.

We have a very practical plan for giving you just the kind of help you need on an installation.

The DUNHAM HEATING SERVICE

C. A. DUNHAM COMPANY, LTD.

TORONTO, ONT.

Branch Offices: Halifax, Montreal, Ottawa, Winnipeg, Vancouver, Calgary

Change-Over Work Our Specialty

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The Victory Loan: A Business Builder

All the money subscribed to the Victory Loan is spent in Canada.

It is distributed direct to YOUR customers.

By making possible the placing of big orders for munitions and other supplies, the Victory Loan keeps the workers in every trade employed at good wages.

By financing Britain's purchases of farm products, the Victory Loan gives the farmers a market for their crop at good prices.

This healthy condition of business brings immediate benefit to every man engaged in the retail trade.

The Victory Loan circulates money among all classes, and much of it must find its way across your counter.

Buy Victory Bonds to insure Canada's continued prosperity.

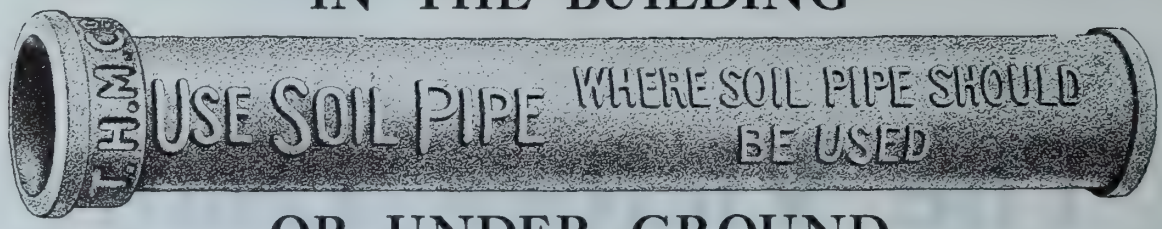
Buy Victory Bonds to stimulate your own business.

Buy Victory Bonds and encourage your customers to buy Victory Bonds, because healthy business conditions are necessary to enable Canada to successfully maintain her efforts to win the war.

Issued by Canada's Victory Loan Committee in Co-operation with the Minister of Finance of the Dominion of Canada.

122

IN THE BUILDING

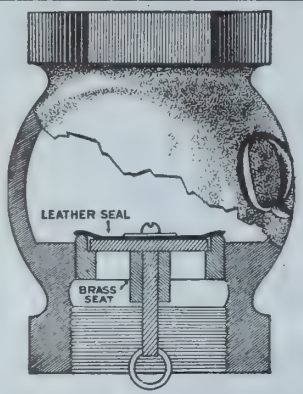


OR UNDER GROUND

ASK YOUR JOBBER FOR T.H.M. CO. BRAND OF SOIL PIPE AND FITTINGS.

TORONTO HARDWARE MFG. COMPANY, - Toronto, Canada

WE MANUFACTURE A FULL LINE OF HIGH-GRADE RANGE BOILERS



This is a "Q" Foot Valve

And it Just *CAN'T* Leak

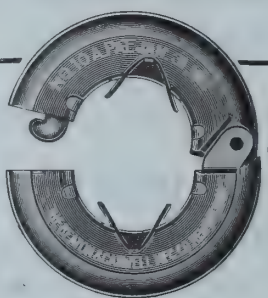
There are more pump troubles caused by "leaky" valves than from all the wear and tear which occurs in the average life of a pump.

The "Q" valve will overcome all priming troubles, and water once raised above it, through the suction line, will not leak out.

If you want the pumps you instal to give maximum, you will require to use the only valve on the market that JUST CAN'T LEAK.

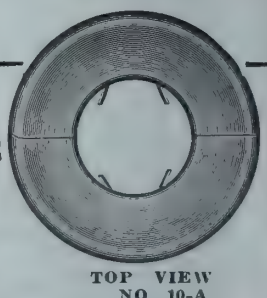
Made in sizes from 1 to 8-inch.

R. MACDOUGALL CO., LTD.
GALT., CANADA



OPEN VIEW NO. 10-A.

The CEILING PLATE that's better



TOP VIEW NO. 10-A.

THE NO. 10—A NARROW FLANGE PLATE IS A STEEL HINGED PLATE. FLANGES ¾" WIDE. HIGHLY FINISHED. ESPECIALLY DESIGNED FOR TWIN CONNECTION "NARROW."

The split ceiling plate is coming more and more into use than ever and ALWAYS GIVES A NICE FINISH, because it can be attached to mains and risers at the very last, and is not exposed during completion of a building on the floors.

High quality at the right price.



Gem No. 4.

Gem No. 4 Automatic Air Valve

Made from the best brass obtainable. Pressed shell and pressed brass base which eliminate danger from blowholes, which is a fault with cast bases.

Write for catalog showing our complete line of specialties.

The BEATON & CADWELL MANUFACTURING Co.
New Britain, Conn.

Eastern Agent: J. R. Devereux & Co., 358 Beaver Hall Square, Montreal. Western Agent: A. E. Hinds & Co., Chamber of Commerce, Winnipeg.

HOYT METAL GOODS ARE KNOWN
FROM COAST TO COAST



As time-savers there are none equal to our Wiping Solder, Bar or Wire Solder.

Hoyt Lead Traps, bends and waste pipe are in a class by themselves.

All our products are made to formula.

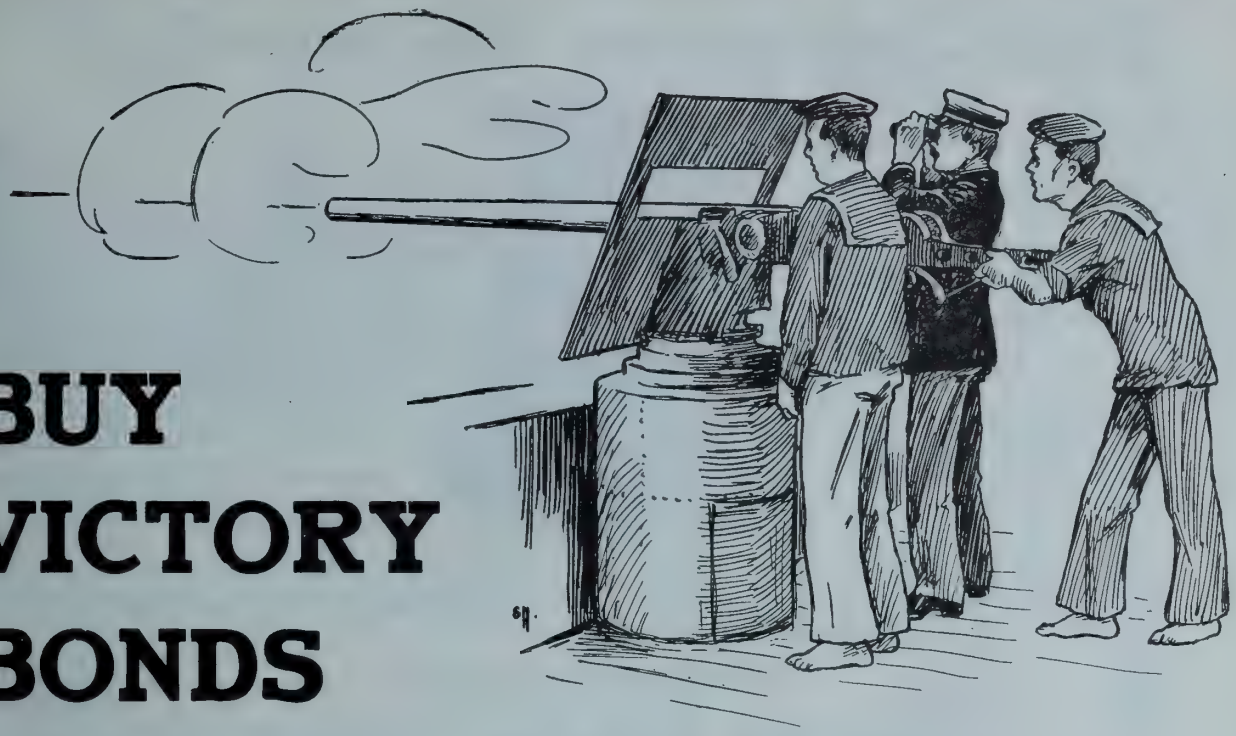


Our Mixed Metal Sales Amount To Over $5,000,000 Annually.

Write your Jobber

HOYT METAL COMPANY, TORONTO, ONTARIO
New York, N. Y., London, Eng., St. Louis, Mo.

Write Us



BUY VICTORY BONDS

WHEN YOU BUY VICTORY BONDS

You are only loaning yourself money and getting interest for so doing. This is no sacrifice but a gilt-edge investment.

BUT

IF YOU DON'T BUY VICTORY BONDS

You simply force the Canadian Government to borrow money from some other source, and by so doing you will have to pay the piper, by paying back both principal and interest.

AND

WHEN YOU NEED PIPE THREADING TOOLS

REMEMBER

We are headquarters for Jardine and Toledo Pipe-threading Tools. Made right in our factory in Hespeler. And by investing your money in our tools you can save both time and money. Our tools are an easy second with Canadian Victory Bonds.

VICTORY BONDS YOU MUST BUY JARDINE TOOLS YOU SHOULD

A. B. JARDINE & COMPANY, Limited, HESPELER, ONT.

Sole makers of "Jardine" Pipe-Threading Tools.
Sole licensees to manufacture and sell Toledo Pipe-Threading Tools in Canada.
Agents, Winnipeg and West—Stanley Brock, Ltd., Winnipeg, Man.
Brockville and East—J. R. Devereux, 358 Beaver Hall Square, Montreal.
Belleville and West—W. H. Cunningham & Co., 183 Church St., Toronto, Ont.

First Cost *versus* Upkeep Cost!

The purchase price means nothing if the upkeep cost is not low.

The purchase price of King Boilers is no more than the average boiler and yet—

The consumption of fuel—*the upkeep cost* is lower—considerably lower.



The thin, peculiarly shaped waterways in the "King" mean quickly heated water and perfect circulation, which causes a saving in fuel because it obviates the necessity of "extra firing" to move cold water from the radiators.

The Trade should use this quick-heating, fuel-saving argument now while fuel is scarce and high in price.

WRITE US FOR PRICES.

Steel and Radiation, Limited

Head Office, FRASER AVENUE, TORONTO

304 University Street, MONTREAL **101 St. John Street, QUEBEC**

AGENCIES IN ALL LEADING CITIES

WROUGHT PIPE

BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES

Black and Galvanized
All Sizes

Ask your jobber for CT **Brand**

CANADIAN TUBE & IRON CO., LIMITED

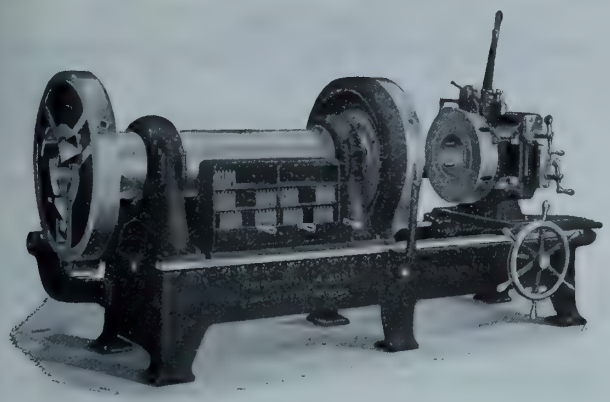
Montreal Works: Lachine, Can.

After the War——What?

The time to put on fire insurance is before the fire. The time to prepare for after-the-war conditions is before peace comes.

Advertise now and be prepared to keep your goods in demand through the medium of SANITARY ENGINEER

Pipe Machines of Merit



THE HALL No. 8

Duplex Improved Gear Box Driven. Capacity 2½ in. to 8 in. inclusive.

Note the drive belt at rear out of operator's way. Elevated die cabinet, control lever and speed levers all convenient to operator's right hand. Sliding die head.

These machines are equipped with a friction clutch, enabling operator to revolve pipe a few inches, if necessary.

Pipe Machines ranging from ⅛ to 18″.
Nipple Machines ranging from ⅛ to 4″.
Roller Pipe Cutters ranging from ⅛ to 4″.

Delivery from stock.

Write us for full particulars and prices.

John H. Hall & Sons, Ltd., Brantford, Can.

The Wrench of 25% Greater Efficiency

TRIMO PIPE WRENCH



Two new features have been recently added to the Trimo Pipe Wrench, namely Nut-Guards, in all sizes, and unbreakable steel frames, in leading sizes.

The Nut-Guards prevent the accidental rotation of the nut while in use.

These improvements add 25% to the usefulness of the tool.

The Trimo Pipe Wrench is made with wood handles in 4 sizes, 6-in., 8-in., 10-in., 14-in. and in steel handles in all sizes, 6-in. to 48-in. inclusive.

All Trimo Pipe Wrench parts are interchangeable.

The inserted jaw in the handle can be readily replaced when worn, thus adding to the life of the tool.



Nut with Nut-Guards



Inquiries from Importers and Dealers Solicited. Send for Catalogue No. 55.

TRIMONT MANUFACTURING CO.

Cable Address: Triwrench
Code: Western Union

Roxbury (Boston) Mass., U.S.A

Over 50,000 Daisy Hot Water Boilers Now In Use—Are *You* Selling Your Share?



Daisy Hot Water Boilers are easiest to sell because they have an established reputation for exactly meeting the requirements of the modern home.

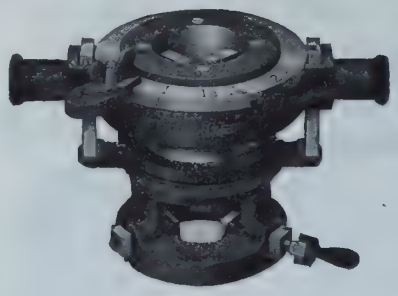
Every Daisy you instal will help build bigger business by bringing repeat orders for installation in neighboring homes later.

AND DON'T FORGET

Buy lots of **VICTORY BONDS.** It's your bounden duty to stand back of our boys.

WARDEN KING Limited, Montreal

BRANCH OFFICE: 136 SIMCOE ST., TORONTO



PIPE THREADING AND CUTTING TOOLS

One Man Can Thread up to 12 Inch.



Cuts Without Burring

You cannot afford to expect your men to make horses of themselves. If they did they could not keep it up. Our tools save time, do better work and make life worth living for your men.

No. 1 cuts from ⅛″ to 1″
No. 5 cuts from ½″ to 2″
No. 10 cuts from 2½″ to 4″
No. 15 cuts from 4″ to 6″

Ratchet	Geared
No. 6—¼″ to ¾″.	No. 41—2½″ to 4″.
No. 25—1″ to 2″.	No. 61—2½″ to 6″.
No. 26—1″ to 2″.	No. 80—4½″ to 8″.
	No. 90—9″ to 12″.

The Borden-Canadian Company
TORONTO, CANADA

"JUST ONE MINUTE"

To call your attention to the Famous B & C Floor and Ceiling Plates.
Our No. 15 style narrow flange designed for the Canadian trade.

One of many styles



No. 15

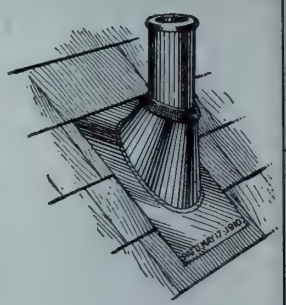
Handsomely nickel-plated or plain
Sizes ½ to 2″

Stock now carried by our Canadian Representative
W. H. CUNNINGHAM & CO., 183 Church St., TORONTO, Can.

THE BEATON & CORBIN MFG. COMPANY
Southington, Conn., U.S.A.

The SIMPLEX Adjustable Roof Flange

Fits any roof from ½ pitch to flat—just slide it down the pipe and it will conform with the pitch of the roof.



Trade Price 2″ $1.00 4″ $1.15

Made in all sizes—For sale by nearly every jobber

Simplex Mfg. Company - Chicago, Ill.
183 Church St., TORONTO, ONT.
Canadian Representative: W. H. CUNNINGHAM & CO.,

Kindly Mention

Sanitary Engineer

When Writing to Advertisers

Second-Hand Pipe

1-2″ to 4″

Black and Galvanized

Send us list of your requirements

Consumers Metal Company, Limited
14 St. John Street MONTREAL
Works: LACHINE, QUE.

"HAUSE" PIPE JOINT CEMENT

For steam, water, air, oil, gas, gaskets, etc. The cement that cements. Sets like gum. Allows no leaks.

The Great Value of "HAUSE PIPE JOINT CEMENT" lies in its peculiar chemical properties which permits of its hardening and expanding after the joints are made up. In making up joints it has the same effect as a lubricant on the best graphite, and while the joints may be made and broken readily, a perfectly tight joint is maintained at all times. Comes in 1-lb., 5-lb., 15-lb., 25-lb., 50-lb. cans, 100-lb. barrels. Manufactured in ready mixed and powder form. Ask your jobber for prices, or write us direct.



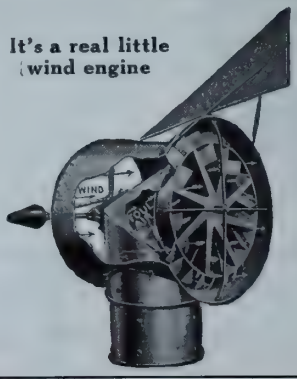
Manufactured in Ready Mixed and Powder Form.

Made in Omaha, Neb., U.S.A., by

Chas. F. Hause Mfg. Co., Inc., Omaha, Neb.
Canadian Representative: Empire Mfg. Co., Ltd., Toronto.

THE BICALKY VENTILATOR

It's a real little wind engine



Is a positive suction fan that ventilates

The "Bicalky" will dispense with all auxiliary heaters on local ventilation systems.

It is, as far as we know, the most scientifically constructed, self-propelled fan ventilator on the market.

Write us for full particulars.

BICALKY FAN CO.
BUFFALO, N.Y.
Canadian Sales Agents:
J. S. Chapman & Company
89 Jarvis St., Toronto

Permanence



THE SECRET OF THE DART'S PERMANENCE lies in the facts (1st), that both faces of the joint are BRONZE (a non-deteriorating metal); (2nd), that the HEAVY IRON PARTS will not stretch or pull apart; and (3rd), that they are made in a factory whose only product is Dart Unions.

Pipe coupling trouble and their upkeep expense do not exist where Dart Unions are used.



"Bronze to Bronze at the Joint"

MANUFACTURED BY
DART UNION COMPANY, LIMITED
TORONTO, CANADA

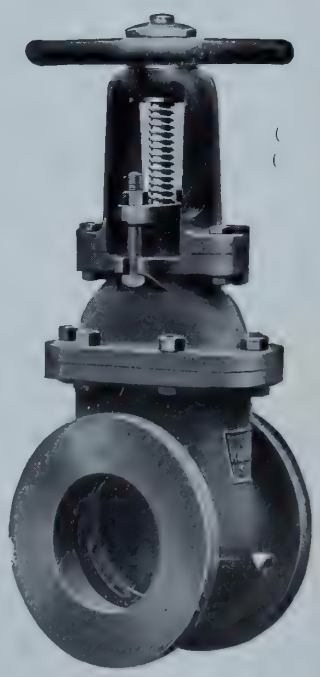
There Are Lots of Gate Valves

Advertised and Sold



but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.
Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.
Approved by the Fire Underwriters' Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario

THE COUNTRY NEEDS COPPER

WHY WASTE IT IN W.C. TANKS?

A TANK WITHOUT A LINING



A TANK WITHOUT A FAULT

EVERY FITTING TESTED

EVERY TANK GUARANTEED

BUY ALL THE VICTORY BONDS YOU CAN AND MORE—

and in that way help to the uttermost in winning the war.

Money, men and metal have done more than anything else toward bringing this war to a successful issue.

Copper is one of the most necessary metals used in warfare, and should be conserved.

Why use it in W.C. Tanks? It is not necessary in the VitrO No-trouble Tank.

Galt Brass Company, Ltd.

Galt, Canada

SANITARY ENGINEER
PLUMBER & STEAM FITTER of CANADA
Vol. XII. Publication Office, Toronto, November 15th, 1918 No. 22

EMPIRE
SELF-CLOSING BIBBS

DO NOT WASTE WATER



Ball-Bearing Lever

China Index Handle

PLATE A 271

This is a splendid bibb. It is strictly high-grade and is just the line that will hold your customers. Every part in the make-up is properly balanced and will save more water in a single year than the first cost. Such a bibb adds to the appearance of any fixture to which it is fitted.

Write us about this line of bibbs and you will be agreeably surprised.

Empire Manufacturing Company, Limited

LONDON TORONTO

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While



A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for BEAVER BRAND CAST IRON ENAMEL WARE

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

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Monarch Brass Mfg. Co., 71 Brown St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes, 120 Lombard St., Winnipeg


BRANDON


WINNIPEG


FORT WILLIAM


NORTH BAY


LONDON


KITCHENER


REGINA


HAMILTON

DOMINION
Rubber System
Belting Service is Dominion Wide


SASKATOON


TORONTO

No matter what your business or where it is located, there is within telephone distance of your plant, a branch of the Dominion Rubber System and a belting expert.

These technical experts are not merely salesmen, *they know belting* and its requirements thoroughly and their services are at your command, without charge, whether you are a customer or not.


EDMONTON


OTTAWA

Put your problems up to the Dominion Rubber System experts—*place your belting equipment in their care—they will shoulder the responsibility* for giving you efficient service in all your belting no matter what it is used for.

They are able to "speed up" your production—reduce your manufacturing or belting costs or eliminate unnecessary delays and "shut downs."


CALGARY


MONTREAL

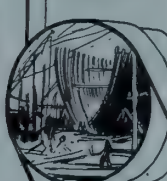
The Dominion Rubber System is not only the largest but the oldest organization of its kind in Canada and has specialized in belting for more than fifty years—its entire facilities and Dominion Wide Service are at your command.


LETHBRIDGE


QUEBEC

If you are in trouble or in doubt about a belt, 'phone, wire or write our nearest branch and *let us prove that our Belting Service means more than just selling belts.*

Canadian Consolidated Rubber Co., Limited
Head Office, Montreal


VANCOUVER


ST JOHN

SERVICE

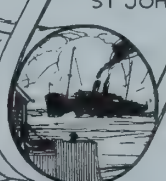
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CANADIAN CONSOLIDATED RUBBER CO. LIMITED
DOMINION
RUBBER SYSTEM
AND ASSOCIATED COMPANIES

BRANCHES

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VICTORIA


HALIFAX

Save the Faucets

By Using

Wolverine Asbestos Rubber Bibb Washers

Made from Rubber and Flake Asbestos, Highest Grade with Lasting Qualities



A full and complete line of money-saving Rubber Goods listed in Catalog "C"

Asbestos Rubber Washers are manufactured by a new process from a composition of rubber and flake asbestos.

The Highest Grade of material obtainable is used.

CANADIAN WOLVERINE COMPANY, LIMITED

CHATHAM, ONTARIO

WE SPECIALIZE IN

PIPE THREADING TOOLS

Take Another Look At This Job

ESTABLISH PEACE

If you desire to establish lasting peace in your shop, you will have to furnish your men with good tools. Men will not do the same amount of work if that work is hard. The more you *INVEST* in tools if they're good tools, the less you will SPEND in labor. To invest is to establish an asset, to spend is to create a liability. Our tools will save you money and make peace in your shop.



ESTABLISH PROFIT

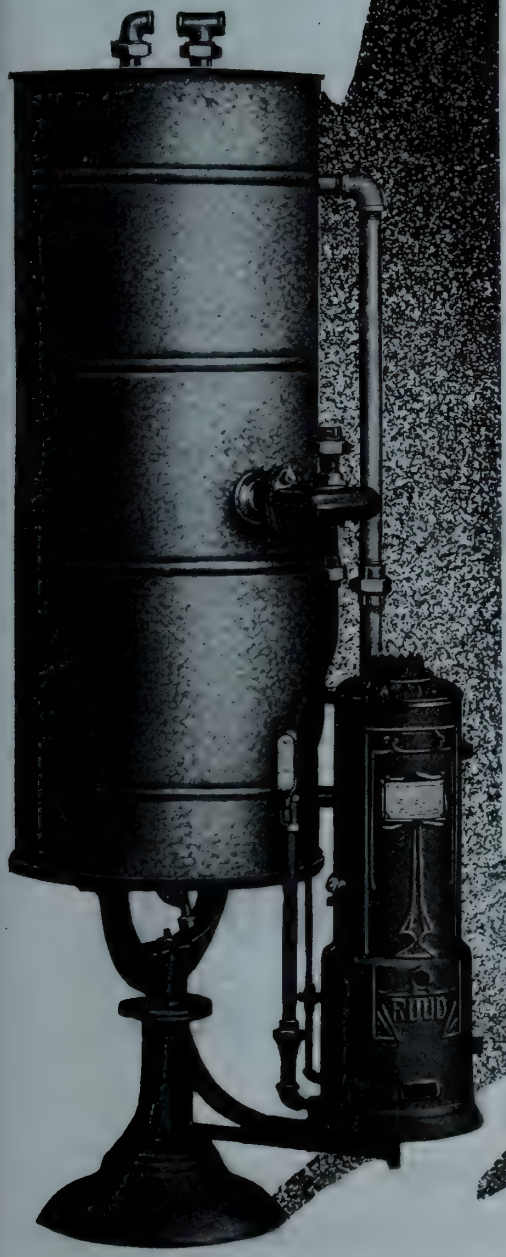
Work made easy becomes a pleasure. Jardine and Toledo Pipe Threading Tools make threading pipe so easy that a boy can thread a 4-inch pipe as easy as he can thread a ½-inch pipe.

Not only so but when a thread is made with one of our tools it's a good thread. No cutting off pieces of pipe. No lost time and no leaks. That's the way to establish a profit on every job.

A. B. JARDINE & COMPANY, LIMITED, HESPELER, ONT.

Sole makers of "Jardine" Pipe-Threading Tools.
Sole licensees to manufacture and sell Toledo Pipe-Threading Tools in Canada.
Agents, Winnipeg and West—Stanley Brock, Ltd., Winnipeg, Man.
Brockville and East—J. R. Devereux, 358 Beaver Hall Square, Montreal.
Belleville and West—W. H. Cunningham & Co., 183 Church St., Toronto, Ont.

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TWENTY years of manufacturing effort goes into every product of the Ruud organization—twenty years of experience, twenty years of skill, twenty years of *performance.* That's why Ruud quality means *first* quality. That's why the Ruud business is the biggest in America and why the Ruud line is the best for you as a profit maker, now and after the war.

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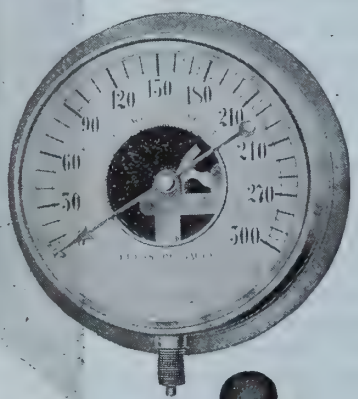
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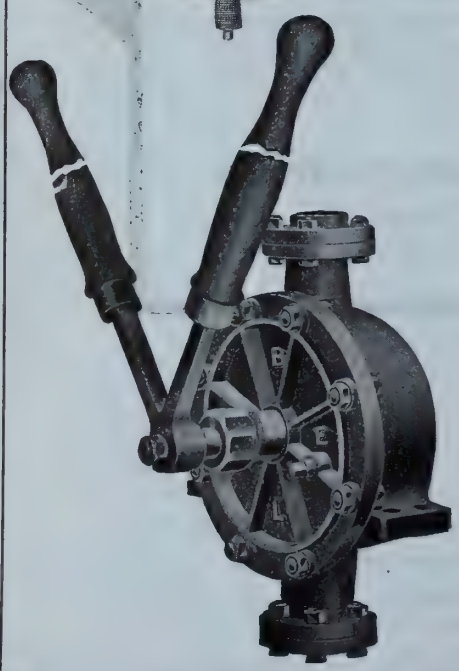
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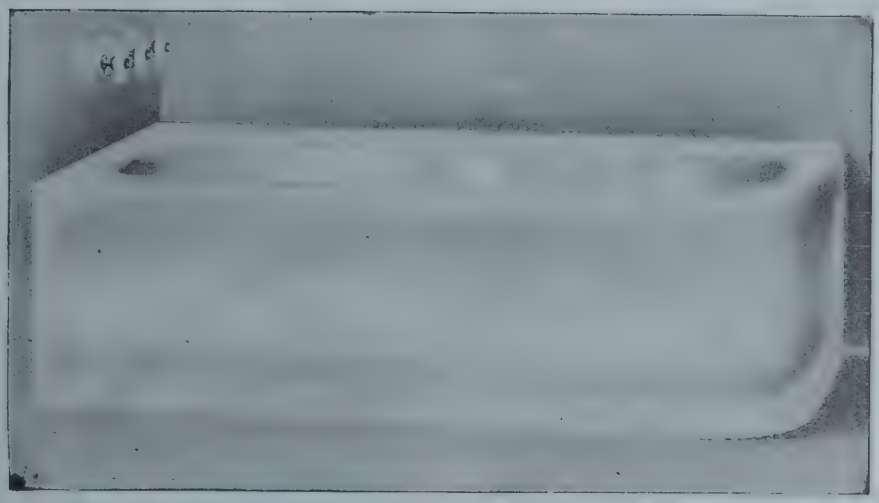
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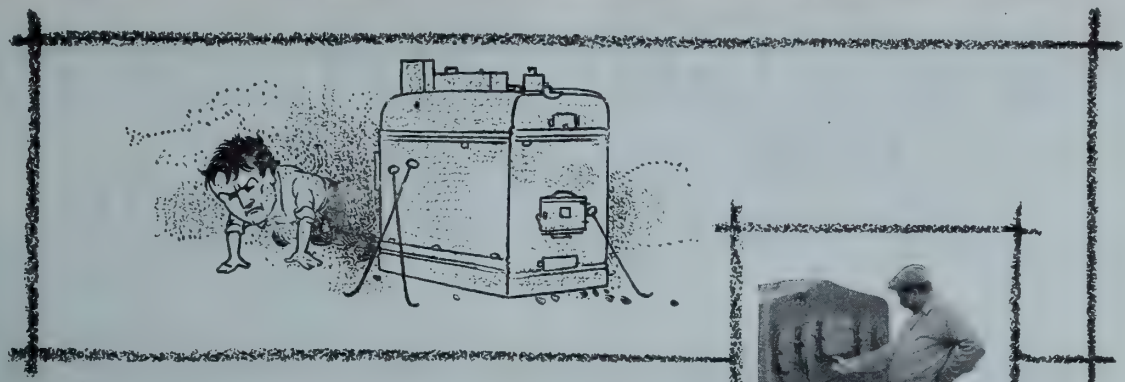
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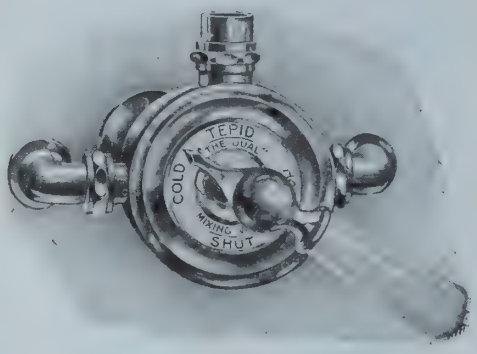
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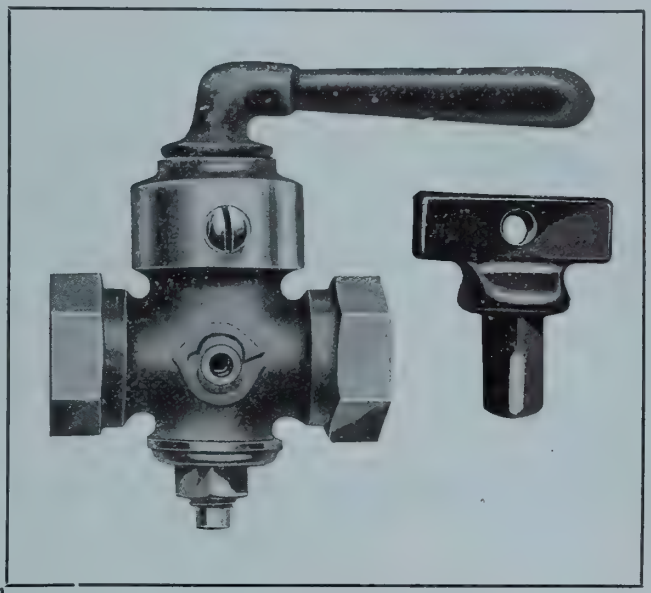




FIGURE E 1024

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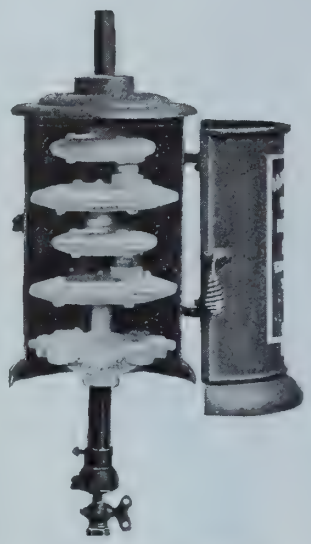
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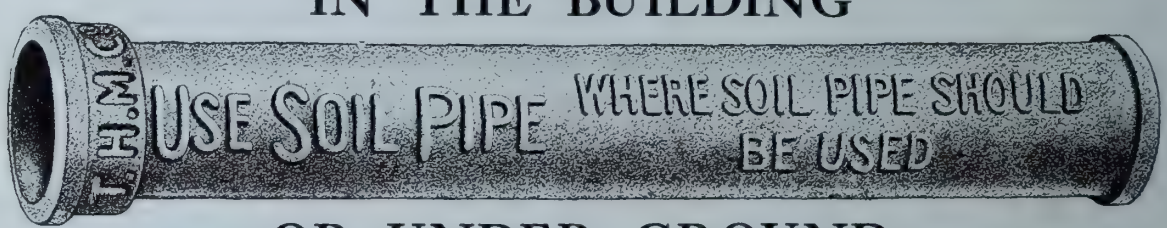


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Letting You Into A Secret

THEY were talking about things in general — Jones and Brown. But it was easily seen by Jones that Brown talked with a positiveness and definiteness lacking in himself. Brown evidently had real knowledge about things and this gave him an assurance lacking in Jones. Jones found himself talking in generalities, and he had the sense to know that what he had to say wasn't very convincing. In the end he spoke up. "Brown, tell me, where do you get your information? You talk like one who knows. You use facts to fortify your opinions, and you seem to have a wealth of information about things Canadian. What's the secret of your greater confidence and knowledge?"

And Brown said: "I'll tell you, Jones, how I have strengthened myself in confidence and knowledge, as you put it. I read my newspaper in a new way now, and I make it a point to know a good deal about Canada, the land of my birth, residence and affection.

"For years—until I was forty—I read newspapers, as many others do—pretty thoroughly. I read about accidents, and meetings and fires, and everything else. One day I woke up,—was awakening up, to tell the truth—to discover that I was just frittering away time when I read everything.—Then I determined to concentrate my interest on matters Canadian—the things about Canada that really matter.

"I wanted direction. I needed a focal point, as it were. What should be skipped, and what should be read closely? I was floundering. I am not much of a politician, and I abominate party politics. I wanted to see things fairly.

"Then one day I made the acquaintance of THE FINANCIAL POST. It seemed to me to give me the direction I needed. I found it was sifting things for me, and giving current affairs their right proportioning. At any rate, it was a new kind of newspaper to me, and I read it with zest.

"I am a business man, and business in its larger aspects is the special field of THE FINANCIAL POST. I found the paper written in a readable way, and that it has a breadth of interest pleasing to me. So I subscribed for THE POST, and every Saturday and over the week-end this paper is pretty thoroughly ready by me.

"I find that the reading of this paper helps me get out of my daily newspaper the meat in it. As a matter of fact, I read my daily newspaper and other papers with a new and informed interest which makes my reading a profitable thing.

"I read somewhere that an hour a day spent on any subject would make a man master of that subject in 10 years. Well, I do not know that I am seeking to be a master of Canadian affairs, but I do know that for the past two years or so I have been having a new joy in life. I am really trying to know my Canada.

"I clip a good deal, and my scrap-book on Canada is a treasure house for me, I collate the material I put in that book, and whenever I want to read up any particular subject, I have before me, gathered up, a surprising amount of material obtained from many sources.

"I take luncheon at the Club daily. There are eight of us who gather daily at the same table. One is a wholesaler, another is a banker, another a publisher, another a manufacturer, another a manufacturers' agent—and so on. We have a representative gathering.

"We talk about many things, and about Canada most of all. I take great satisfaction from the knowledge that I am able to hold up my end of the conversation. To tell you the truth, it is this reputation that spurs me on to keep myself brushed up all the time. I own up, also, to practising a little subtlety. I guide the conversation in the direction of a subject that I am well informed on, and then I bide my time, letting others wrestle with it until they have told all they know. Then is my chance, and I am able to say something useful to a company that is attentive.

"Jones, if you want to improve the quality of your information, read purposefully, objectively. Cut out the reading of everything under the sun. You are a business man, the same as I am. Why not read definitely along the line of business? You will find it a most pleasurable kind of reading, and you'll find that you will acquire the sifting mind which will enable you to pass over a lot of stuff of no value to you, and seize on material of real value.

"I recommend THE FINANCIAL POST as a paper that will give your reading direction. It has helped me much, and I believe will help you. At any rate, it is easy to try it out."

IF JONES wants to try out THE FINANCIAL POST he can have it go to him by mail for four months for a dollar bill. One thing that ought to impress and please Jones is that THE POST is not a one-man paper. It is produced by many men, each a surpassingly well-informed man on the subject he writes. One man writes on matters pertaining to agriculture, another on the iron and steel industry, another on the food problems and milling and cereal subjects, another on insurance, another on textiles, and so on. The special contributed articles which are a regular feature of THE POST are by authorities or by men of position. Besides which, THE POST surveys many fields of interest, and this survey is world-wide. It is a meatful paper, in very truth, and assures those who read it regularly an amount, kind and quality of reading not commonly found in a single newspaper. If you would make your daily reading take on a new interest and value, we suggest that you should sign and forward the coupon opposite.

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if you are not carrying a stock of Clark Temperature Boosters, and making a practice of installing them on every hot water job you know of, whether an old job or new installation.

Save Piping and Fittings

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It also means that you conserve material and also assist in saving coal, to the extent of **15 per cent.**

Here's an example. A house requiring 10 tons of coal to heat it during a winter season will only burn 8½ tons and procure greater comfort from the fuel burned.

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SANITARY ENGINEER

VOL. XII. NOVEMBER 15, 1918 No. 22

Discussion on the Main House Trap

Main House Trap Prevents Thorough Ventilation of Main Sewers—House Drain and Soil Pipe Stack Only Logical Way to Keep Atmosphere in Sewers and House Drains Free From Dangerous Cases—Several Sanitary Engineers Quoted Both for and Against

At meeting of American Society of Sanitary Engineers

MR. CLAFFY: Gentlemen, in connection with the house trap as related to this ventilation question in the corrosion in buildings, I might add this, at the risk of repeating what was said at previous meetings, that investigations made by competent engineers showed that the air in the house drain was worse than the air in the main sewer in the street. You will find that in the report of the Royal Sanitary Institute of Great Britain, which spent five years studying this house trap proposition, they reached the conclusion that the house trap was a nuisance, that it served no good purpose, that it had best be eliminated and that the installation of a house trap prevented proper ventilation of the drainage system within the building because of that fact that while fresh air vents were provided for in theory in the ordinances and were installed in practice, they served no such purpose, they became stopped up, consequently in a short time they were in a very bad condition, became stopped up and were of no use. This Royal Sanitary Institute made investigations in every town practically in Great Britan and Ireland.

In Toronto quite a large number of buildings were examined, and the wrought pipe is found to be in a sad state of corrosion. The law requires a main house trap and it is installed on every plumbing installation. Mr. Newsome gives me this information.

Mr. A. J. McGookin: May I ask Mr. Newsome if, where that law applies, there is a fresh air vent always required?

Mr. Newsome: Yes.

Mr. McGookin: The question of the main house trap has been discussed at all the meetings of this Society that I have attended in the past six years.

Do the members of this Society consider that most local codes or ordinances call for cleanouts with removable covers to be placed at certain intervals on the house drain? These covers are invariably removed by some one other than a plumber, who does not take the trouble to return them to the proper place. The consequence is that when there is no main trap as a protection against the entrance of sewer air, the sewer air is emitted through the cleanout and in this way the purpose of every trap in the building is defeated.

I desire to go on record as being opposed to the elimination of the main house trap.

Mr. Devine: Mr. Chairman, last year we had a very severe winter. I took quite a few observations of the roof terminals in my home city. I found that in all cases where I made my investigations all pipes less than four inches were frozen during a certain period—from zero down to 13 and 16 below.

I feel, Mr. Chairman, that this is a question we want to get right. Possibly we all have our own difficulties and different views and opinions on them, but it seems to me that where the roof terminals are frozen up in cold periods similar to last year without the main house trap where there is defective plumbing work, we simply create byplaces to ventilate our sewers in the buildings. I found considerable of that last winter where we had reports coming into the office of odors emanating from different localities. I made my investigation and found that in some cases it was where no house drain had been installed prior to the regulation, and nine times out of ten it was where we had old crock or tile drains. We found open joints and the sewer air was pouring out because there was no possible way of getting out at the roof terminals. Of course, I will admit there are cases and conditions where the fresh air vent inlet will become stopped up and there is a way of putting in a fresh air inlet that will remain open all the time. I find that by admitting fresh air at the entrance of a building just beyond the main house trap we can establish a situation where there isn't a possibility of any air or gases generating there to become effective or dangerous to public health.

On the other hand, as I stated before, where we found the roof terminals stopped up last winter, contrary to the great opinions coming in here from papers just presented, we found that sewer gas or sewer air, whatever you might term it, was to be found in a great many cases where we had defective plumbing installations.

What is our great function here—to ventilate main sewers or prevent the entrance of sewer airs into our dwellings? I feel there is a possible way of doing it without eliminating the main house traps.

Acting President: I hope we will have a very full discussion of this subject. My memory runs parallel to that of Mr. McGookin, that it has been discussed a great deal, bue we have never as a society voted to any conclusion. While we can not expect to unanimously agree upon such matters, yet if we are to ever get to a standard code, we must find out after discussion and consideration and experiment the desires of the majority and then embrace that in our record. I hope, therefore, that we will have a very full discussion.

Mr. C. A. Rainger: Mr. Chairman, I would like to know if it is the intention of the Society at this convention to take a vote on whether or not we shall endorse the use of the main house trap. If that is the intention, then when the motion is made I believe it is proper to air some of our views. If, however, it is not the intention to endorse the use or elimination of the main house trap at this convention, then we may confine our remarks possibly to some other subject, and possibly some of us may see fit to sit still and not make any remarks. I believe the time to really air our views is after a motion is made.

Mr. Claffy: Mr. Chairman, I move that this Society go on record as disapproving the use of a main house trap on house drain installations. (Motion seconded.)

Acting President: You have heard the motion stated by Mr. Claffy, which has been supported. We are ready for remarks.

Mr. Tweedy: I wish to state a few remarks with reference to my experience with the house trap. I don't believe that any man is safe in eliminating the house trap from his recommendations. I have had occasion to be in congested districts in the City of Cincinnati where the house trap has been eliminated, and on a ten-inch line

coming from the main sewer in the winter the entire main of a big factory basement was frozen up.

I believe the intention of omitting the house trap is to ventilate the main or city sewers. If that is true and if that is the belief of this Society, that the main sewers should be ventilated, it is possible to ventilate them. They should be ventilated through a line taken off in front of the trap and extended to the roof, as we have done in Cincinnati years ago, but we have eliminated that practice due to so much talk of eliminating the house traps. I believe that the quickest way to ruin a man's plumbing system is to eliminate the use of the house trap. If I were installing a job of plumbing in a house to-morrow, I would try to prevail upon the inspector of that locality to allow me to use my house trap, and I would extend a vent line from the front of the house trap to the roof of the building .

I don't believe it is the intention of this Society to eliminate the plumbing work. I don't believe that we are working for that purpose. There has been an order issued by the Government recently where they are going to eliminate the vents and so forth, and I believe if there is an inferior grade of plumbing that is being installed to-day, it is being installed by the Government.

I believe the Chairman of the meeting is acquainted with some of the action that has been taken in Washington in reference to eliminating certain branches of ventilation in plumbing systems for at least the duration of the war.

I am satisfied that if those practices are put into effect without opposition from this Society, they will be hard to remedy after we have created peace.

Now, my idea or understanding of this Society is that you are trying to uphold the policy that the plumbers and sanitary engineers have fought for years, and we should, I believe, by action of this convention, make some references with regard to the letter which is now in print and has been acted on by the War Policy Board or some such board in Washington.

However, I am in favor of the use of the house trap.

ANOTHER ATTEMPT TO FORM A FEDERAL DEPARTMENT OF HEALTH

Sanitary Engineer Has For Years Advocated That a Federal Department of Health be Organized—Is This Another Attempt?

FOR years SANITARY ENGINEER has taken the stand that a federal department of health should be organized but to date nothing has come of it, only attempts, and we are almost of the opinion that this is only another attempt which is reported in the Toronto *Globe* (see quotation).

Some years ago Ottawa lost many, many valuable lives as a result of two severe typhoid epidemics, results—an attempt at forming a federal health department, since then there have been several attempts.

With "Spanish flu" carrying off lives by the thousands, there comes still another attempt, and as we said before we may possibly have scores more before any real work of organization will be effected. However, the following item shows what is proposed to be done this time.

Federal Government Will Ask Parliament to Pass Bill

OTTAWA, Oct. 24.—The national epidemic of "Spanish influenza," which has hit the capital particularly hard, has been an object lesson to the Cabinet Ministers here as to the need of a Federal Health Department. A tentative agreement was reached by the Cabinet some time ago to organize such a department under the Minister of Immigration and Colonization, Hon. J. A. Calder. The epidemic which is now ravaging Canada has brought the question up again in urgent form before the Government, and it is understood that Parliament will be asked at the coming session to pass a bill creating a Department of Public Health, to be administered by the Minister of Immigration and Colonization. A national laboratory along the lines of the Washington laboratories will be established. The present health branches of the Interior, Immigration and Agricultural Departments will be merged in the new department.—*The Globe.*

The present epidemic is first and last a filthy disease, it is also a preventable disease, and would not be present were sanitary engineers given some loop-hole through which to work.

No very great scheme has ever been accomplished by the medical fraternity, talk as they may. It is always the work of engineers. We have mentioned several of these instances before, but they are well worth referring to again. We cannot help but recall that the medical men had to make way for the sanitary engineer in connection with the Panama canal project, now one of the world's greatest achievements. Camps and contonments cannot exist without the work of the sanitary engineers. The work of sanitary engineers has made it possible to conduct this present war with a less loss of life from disease in our armies than is found in our civilian population. This is a fact, we would refer our readers to figures quoted in the address given by Professor Arthur Bateman before the members of the American Society of Sanitary Engineers. One of the latest achievements, purely the work of sanitary engineers, is that of furnishing pure water for the inhabitants of The Holy City, Jerusalem. What are our own medical men doing? Absolutely nothing. The only real progress made by men of that class is in surgery and surgery is more or less an engineering feat, with cleanliness and sanitation the closest ally.

So, if we must have a Federal Department of Health, let it not be a department of medicine, pure and simple, but rather an organization embodying all that medicine can do, all that surgery can do, and all that sanitation, heating and ventilating engineers can do. Let's get rid of the up-to-date medicine man.

BURN WATER INSTEAD OF COAL

Issued by the Ontario Fuel Administration.

Temperature recommended by the Ontario Fuel Administration for working and living-rooms, 64 F.

(64 is the "optimum" temperature, or the degree of heat, at which science agrees man is at his best)

Temperature recommended for sleeping-rooms, 56 F. or less.

"Make water warm you instead of burning an excessive amount of coal to do it," is the advice of the Ontario Fuel Administration in urging the importance of properly moistening the air in the home.

Dry air at 70 or 72 may feel cooler than moist air at 60°, the Administration declares, Moist air holds the heat longer and saves coal.

There are ten per cent. more deaths at a given temperature if the relative humidity is below 40 per cent. than if it is above 70 per cent.

Give the air a drink out of a pan instead of off your skin. Evaporation from the skin renders one susceptible to colds, catarrh and other diseases of the respiratory organs.

As much, if not more, attention should be paid to the humidity reading as to thermometer reading. A hydrometer, as well as a thermometer, should be in the home.

The Department urges every householder to follow these simple rules for humidifying air in the homes:—

When the house is heated by stove, have a pan of water or a boiling kettle always on top.

If by warm air, see that the water retainer in the hot-air jacket of the furnace is always well filled. Place open pans of water near the registers.

In cases where steam or hot water systems are employed, provide humidifiers, or pans of water, for every radiator.

The average room may require a quart of water per day. Change water frequently.

City of Brantford Plumbing By-law

Plumbing By-law Number 1450—Some New and Very Practical Clauses Not Embodied in Many Plumbing Ordinances—Each Clause of Importance Commented Upon—Charges Made for Each Inspection

(Continued from Oct. 1st issue)

THE concluding comments regarding this plumbing bylaw which appeared in the Oct. 1st issue referred to clause 32, and dealt with the question of artificial light for W. C. compartments.

Clauses 33, 34 and 35 are all practical and read as follows:—

Water Supply

33. All water closets must be supplied with a sufficient quantity of water to keep them at all times clean and well flushed and shall be supplied from a tank. Direct service to a water closet is not permitted. Wastes from frost proof closet valves shall not be connected to soil or waste pipe.

Anti-Freezing Water Closets

34. Long hoppers with flush tanks and flush rims shall be used for anti-freezing water closets. They shall be separately trapped directly underneath by a trap having a cleaning screw or cover. When located in a building used for human occupancy such water closets shall be ventilated and back-vented as an ordinary water closet. When located in a yard, or building not having direct communication with its living portion, no ventilating pipe or back vent will be required.

Prohibited Closets

35. Pan, plunger and valve water closets having direct connection to any water service, latrines, troughs, earthenware closets with vent horns and the "Smead" system of closets are prohibited. Long, oval or straight back hoppers with flush tanks and flush rims are prohibited except for anti-freezing water closets.

If clause 33 was to be taken literally it would not be permitted to use flushometers, because of the fact that it reads, "all water closets must be supplied with a sufficient quantity of water to keep them at all times clean and well flushed, **and shall be supplied from a tank.**"

We are of the opinion that the last seven words are superfluous, and that the clause would have been complete and none the less practical.

Yoke Vent System

36. The "yoke" vent system shall be used for a group of water closets or other fixtures. Water closets and slop sinks with sink and trap combined are not required to be back or re-vented when attached to the "yoke" vent system unless the said fixtures are more than five feet from the soil pipe. All other fixtures attached shall be properly trapped and back vented or provided with approved anti-syphon traps. A modified yoke vent in which one ventilating pipe is connected to the other may be used for a group of water closets located in a cellar or basement provided there are no other fixtures connected to the soil pipe above the said water closets.

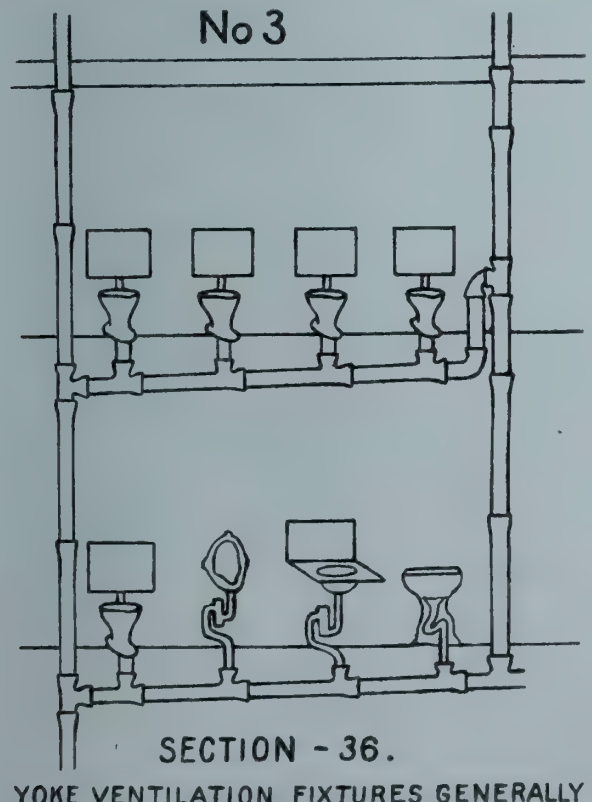
The "yoke" shall not be constructed of pipes less than three inches in diameter and where there are four or more water closets the diameter shall be at least four inches. A modified yoke vent system may be used for sinks, basins and urinals, provided the trap of such fixtures is not more than two feet from the vent line and Y's or TY's are used at the connection.

Closet Vents

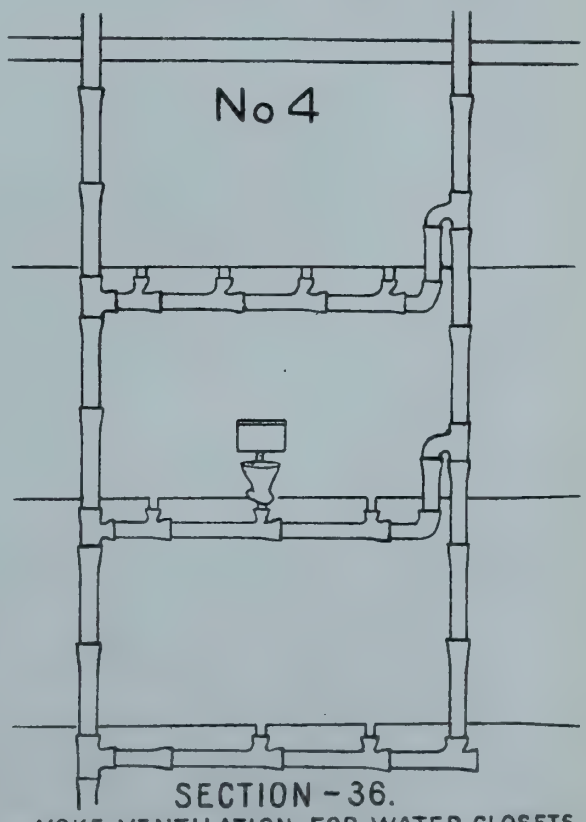
37. A water closet shall be back vented by connecting the back vent pipe to the soil pipe or house drain as close to the fixture as practicable. In no case shall a back vent pipe be connected to a water closet above the floor joint, except in the case of cast iron closets which may be vented above the floor. When a number of water closets are located on different floors and discharge into one stack, all shall be back vented except upper closet, which shall be back vented except when there is no fixture above it.

All water closets whether located on the yoke vent or otherwise shall be back vented when located more than five feet from the soil pipe, yoke or stack. When two water closets are located on the same floor and discharge into a single "Y" or "TY" branch, they shall be back vented with a two inch pipe when one or both are more than five feet from the stack.

When more than two water closets are located on the same branch of a sewer in



YOKE VENTILATION FIXTURES GENERALLY



YOKE VENTILATION FOR WATER CLOSETS

the basement of a block or manufacturing building, individual back vents need not be used. Re-venting shall be provided by running a separate stack or by the use of the modified yoke vent system herein before provided.

When there is but one water closet on a stack located less than five feet from the stack, no back vent will be required. When two water closets are located on the same floor and discharge into a double "Y" branch and there is no other water closet discharging into the stack above such branch, said water closets will be considered one fixture, and it will not be necessary to back vent either.

The accompanying illustration will describe more clearly the meaning of some of these clauses. In fact by carefully studying the illustrations, it will be seen that a number of these are very much more up-to-date than are in operation in many of our larger Canadian cities.

The reference however, to the three inch yoke vent for less than four W. C's., we think would have been quite in order had it read 2 inches, particularly when we consider that a four inch yoke vent is apparently allowed for any number of W. C's. in excess of four. This clause also refers to anti-syphon traps, but, as SANITARY ENGINEER has stated many times that "there aint no sech animile," the question could have been much clearer if a number of illustrations of the "approved traps" had accompanied this bylaw.

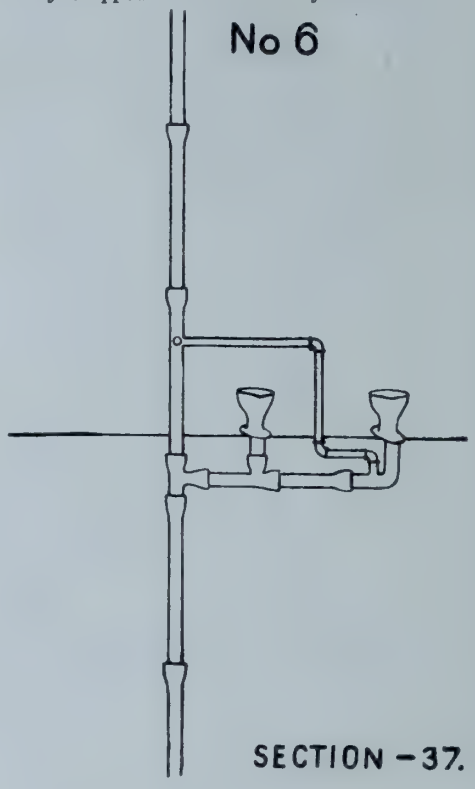
In clause 37 our readers will note that a W. C. fixture need not be back-vented when no higher fixture is on the stack. This, however, must not be taken as allowing the bath and lavatory trap to be installed without vents. The two latter named fixture traps must be separately vented according to this bylaw.

Non-Absorbent Material

38. All wash trays, sinks and other fixtures when used in residences must be of non-absorbent material.

Waste Pipe Connections

39. The waste pipe from any fixture shall not be connected with the trap of a water closet or any other fixture. Except in cases where an anti-freezing closet is the only fixture installed, the waste from a sink may be connected to the house side of the closet trap, said sink waste to be properly trapped in the ordinary manner.



SECTION – 37.

Gratings

40. Exit pipes to all fixtures except water closets shall be furnished with suitable permanently attached strainers or gratings.

Overflow Connection

41. Overflow pipes from fixtures must in each case be connected on the inlet side of the trap.

Grease Traps

42. Sinks in all hotels, restaurants, boarding houses, laundries or other places where the Inspector may direct, shall be provided with suitable grease traps.

Cleanouts

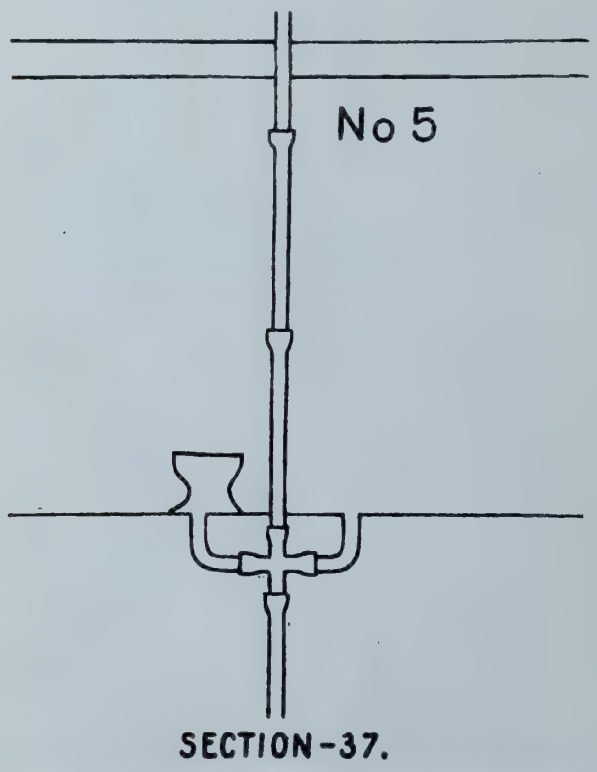
43. All horizontal runs of soil or waste pipe of a length of ten feet or over to have cleanout screws with brass caps or of a pattern approved by the Inspector placed at the end of horizontal run, at the front wall of buildings and at every right angle change of direction except branches. Cleanouts to be placed in accessible positions.

Cellar Drains

44. Cellar drains or floor waste shall not be less than two inches in diameter. Such drains shall be provided with a suitable trap having a seal of at least three inches in depth, and the said trap to be of the same size and material as the drain. Except where there is a sufficient intake of water to insure a seal at all times said traps shall be closed by a brass screw cap. When a floor waste is installed in the basement of a residence the waste pipe from a set of laundry tubs or a sink may be connected to the house side of floor waste trap, an unvented trap to be placed on waste at sink or tub.

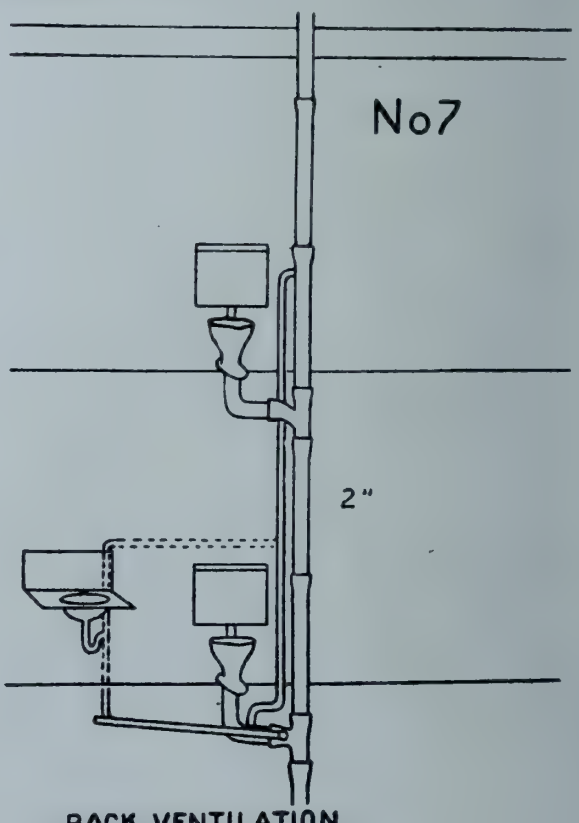
Clauses 38 to 43 inclusive are all practical and commendable. The question of grease traps is thought by many to be controversial. But clause 44 is rather out of the common, though in the opinion of SANITARY ENGINEER none the less practical.

There are thousands of houses that



SECTION-37.

WATER CLOSET WITHOUT INDEPENDANT BACK VENTING



BACK VENTILATION FOR FIXTURE GENERALLY

were erected some 10 to 15 years ago in which no laundry is installed, and the extra cost of back-venting the traps has often prevented a pair of laundry tubs being installed later. We fail to see what logical reason there is to demand that this trap should be vented if same is connected as required under this clause, and no doubt many a laundry tub will be sold and installed as a result of the adoption of such a clause in Brantford.

Back Water Valves

45. In the Holmedale, Eagle Place, West Brantford or other low lying areas where there is danger of water from the sanitary sewers backing up into the basement, back water valves or traps of approved pattern shall be placed on the branch serving basement fixtures.

Rain Water Conductors

46. Rain water conductors inside of buildings shall be constructed of medium cast iron soil pipe with caulked lead joints, or galvanized wrought iron or steel pipe with screwed joints. Connection to the roof is to be made by a brass ferrule caulked into hub of cast iron pipe, or screwed into fitting on wrought iron pipe, or in other approved methods. Ferrule to be soldered to a sleeve attached to a hopper constructed of sixteen ounce sheet copper. Hopper to be provided with a heavy wire convex basket shaped grating securely attached to same. These pipes to be inspected by the Inspector. Rain water leaders must not be connected with the Sanitary Sewers.

Storm Sewers

47. Storm Sewer drains inside of buildings, shall be of cast iron, galvanized wrought iron or steel pipe. They shall be trapped with a trap having a cleaning screw or cover, and in case of basement drainage, a back water valve shall be placed on the basement branch.

Old Plumbing

48. Where plumbing works have been completed in a building before this By-law came into force, if the plumbing has been done in accordance with this By-law, permits will be granted for making connections with the sewer as in new work. But in case the plumbing is not in accordance with this By-law, such alterations shall be made as the Inspector or Medical Health Officer may direct, to make the plumbing safe for the persons residing in the house. In all cases the soil pipe shall pass through and above the roof. All fixtures must be effectively trapped, fixtures and pipes clean, waste and soil pipes to have sufficient fall.

Hoppers

49. Hoppers of approved design and location for the discharge of household and other liquid refuse will be permitted in yards, carriage houses, factories, etc. All storm water must be excluded. The outlet to the hopper shall be through an iron grating permanently secured to the cast iron outlet pipe which shall not me less than two inches in diameter. The iron outlet pipe shall be vertical from the grating of the hopper to the iron trap of the same diameter as the outlet pipe, and arranged so that it cannot be frozen. The horizontal sewer leading from the trap shall be of iron or of glazed sewer pipe.

There need be no comment made with reference to clauses 45, 48 and 49, but clauses 46 and 47 refer to the use of steel pipe for rain water leaders or storm sewers (inside the building). To this SANITARY ENGINEER takes strong exception.

SANITARY ENGINEER has for some time been conducting investigations with reference to wrought pipe and has used the trade term "wrought iron pipe," because of the fact that very seldom is wrought pipe sold to the trade as steel, but rather, it has been proved that steel pipe has been furnished and installed when the specifications have distinctly required "wrought iron pipe," and while SANITARY ENGINEER has been condemning the use of wrought iron pipe for soil waste and drainage pipes, it has been found that most of the material furnished for W. I. P. was none other than steel, and steel has none other than steel, and steel pipe has without doubt been the cause of all the trouble.

We cannot find in all our experience any proof that steel pipe is fit for sanitary drainage purposes, and would far rather have seen these clauses state specifically either wrought or cast iron pipe should be used for the purpose named in clauses 46 and 47.

General Inspections

50. Through settlement of walls, frost, use of improper materials or by poor workmanship, it is possible that plumbing fixtures may become broken or leaky. To protect the citizens from the dangers that might arise from any such occurrence, as well as to prevent the improper use of fixtures, a general inspection shall be made by the Inspector or such other person as the Medical Health Officer may appoint, at least every five years, and at any other time the Medical Health Officer may direct. It shall be lawful for the Inspector or other person appointed by the Medical Health Officer to enter upon premises at any time for the purpose of making an inspection of the plumbing work.

Insanitary Conditions

51. If water closets, water closet compartments, urinals, slop sinks or other fixtures are at any time found by the Inspector to be in an insanitary condition, the tenant or owner will be notified in writing of the fact, and ordered to remedy the matter and if this is not immediately done, he shall be proceeded against.

Penalty

52. Any person convicted of a breach of any of the provisions of this By-law shall forfeit and pay at the discretion of the convicting magistrate, a penalty not exceeding the sum of Fifty Dollars for each offence, exclusive of costs, and in defaut of the payment of said penalty and costs forthwith the said penalty and costs, or costs only, may be levied by distress and sale of the goods and chattels of the offender; and in case of there being no distress found out of which such penalty can be levied, the convicting magistrate may commit the offender to the common jail of the County of Brant with or without hard labor, for any period not exceeding ten days, unless the said penalty and costs be sooner paid.

53. By-laws numbers 436, 576 and 950 are hereby repealed.

Passed this 4th day of March, 1918.

H. F. LEONARD, Clerk. M. M. MacBRIDE, Mayor.

In conclusion we might state that on the whole the city of Brantford is to be complimented upon the sanitary plumbing regulations in operation, especially so, when, as our readers know, that besides the laws governing plumbing construction, there is also a bylaw governing plumbers, both employers and journeymen, this latter making a very practical set of ordinances.

STRENGTH OF WELD IN WROUGHT-IRON PIPES

Welded pipe made of wrought iron or steel is always subjected to a hydrostatic test before leaving the mill. The range of pressure applied in ordinary practice is from 250 up to 2,000 lbs. per square inch, the great majority of sizes of standard-weight pipe being tested under a pressure of 750 to 1,000 lbs. per square inch. As the hydrostatic test is an evenly applied bursting load of short duration, it does not ensure against splitting of pipe at the weld under torsional, tearing, or compression stresses which are encountered in the course of cutting, threading, bending, and installing.

The strength or dependability of the weld in iron and steel pipe has sometimes been open to question, and as every pipe specialist knows from experience, new pipe may show a tendency to split under stresses apparently much below the hydrostatic test pressure. When the pipe is well made from a good grade of material the percentage of such failures should become negligible, although they may not be entirely avoidable. In fact, lap-welded pipe should be especially reliable.

The subject has been quite thoroughly studied by pipe manufacturers for the purpose of improving their product. For example, in order further to minimize the percentage of weld failures, the A. M. Byers Co., of Pittsburgh, Pa., subjects all crop ends of pipe, the point where the greatest number of defects will naturally occur, to a crushing test.

A series of flattening tests on pipe which had already been subjected to the mill tests referred to have been carried out by Edward A. Klages, of the University of Pittsburgh. One hundred and sixty pieces of pipe of various sizes, both butt-weld and lap-weld, were tested, the pieces being placed at varying angles to the vertically applied pressure. Of the 160 pieces tested, including all sizes from 1 in. to 12 in. of different weights, only 12½ per cent. showed commencement of failure at the weld. In spite of the excellent welding quality of genuine wrought iron, for which this material has always been favorably known, the results of the tests were a little surprising in showing, in the main, less tendency to fracture at the weld than elsewhere, thus leading to the conclusion that the weld in genuine wrought-iron pipe is at least as strong as the body metal for a like application of stress. This was shown also by the fact that the position of the weld with respect to the applied load in flattening had no influence upon the location of the place of initial failure.—"Gas Age."

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VOL. XII. NOVEMBER 15, 1918 No. 22

WHAT MORE CAN WE DO

ON another page there appears an article entitled, "What More Can We Do to Win the War?" by Prof. A. Bateman.

Mr. Bateman read this paper at the recent annual convention of the American Society of Sanitary Engineers and at that time very few persons were looking for such a sudden collapse of war activities.

As the paper contains some splendid food for thought, war or no war, we have published it for the benefit of our readers, knowing full well that those who read it will see the enormous value of sanitary engineering and what it stands for—its value in peace as well as war.

Take, for example, a few of the figures quoted by Professor Bateman in connection with the death rate of our army at this date as a result of putting into practice all manner of sanitary engineering constructions. Then consider the amount of fats and greases that are allowed to waste into our drains and sewers. These are all sanitary engineering problems we must solve. The future of the worker in factories, offices and workshops must be given more thought than has been given in years gone by. There is big business, too, to be procured.

And now that the men in our armies are looking to home-comings they must be given something to do. Factory sanitation is a new field, comparatively speaking—a field very little cultivated and such work is of a lasting, progressive nature. It will conserve the health of the worker who, as a result, will become more competent at a less physical and mental strain to himself.

Every member of the trade should, if need be, devote some study to looking over the plumbing by-laws of his town. And if there be no by-law in operation then one should be compiled and put into force, all with a view of not only simplifying same but also to encourage more plumbing being installed.

All these measures are progressive, sound and lasting and bring peace to body and mind because, after all, life is one long struggle. Then let each and every one make it peaceful and not like the struggle of war, which means destruction and bloodshed.

SO SHALL YE REAP

TO a certain extent the war is over. As we all know that while the killing of the body has ceased, there is still a great work ahead, in fact the most serious matters, which involve the happiness and welfare of every human being, are to be considered.

It is with these thoughts in mind that we must all hope and pray that our statesmen may stamp out all feelings of vindictiveness, selfishness and greed from their minds. They one and all would do well to remember that the Maker of all things only is Mighty, that those who flourish by the sword will perish by the sword.

Every man, woman and child should be taught that Germany's downfall did not begin to take place when the people declared war in 1914, but rather on that day when they struck the first blow in the Franco-Prussian war. We believe the following poem, written evidently in the year 1871 and published in 1876, is particularly interesting at this time. It proves that unless right and might go hand in hand there can be no peace.

THE KAISER'S CROWN

(Versailles, January 18, 1871)

The wind on the Thames blew icy breath,
The wind on the Seine blew fiery death,
The snow lay thick on tower and tree,
The streams ran black through wold and lea;
As I sat alone in London town
And dreamed a dream of the Kaiser's crown.

Holy William, that conqueror dread,
Placed it himself on his hoary head,
And sat on his throne with his nobles about,
And his captains raising the wild war-shout;
And asked himself, 'twixt a smile and a sigh—
"Was ever a Kaiser so great as I?"

From every jewel—from every gem
In that imperial diadem,
There came a voice and a whisper clear;
I heard it, and I still can hear—
Which said, "Oh, Kaiser! great and strong,
God's sword is double-edged and long."

"Ay," said the emeralds, flashing green—
"The fruit shall be what the seed has been—
His realm shall reap what his hosts have sown,
Debt and misery, tear and groan,
Pang and sob, and grief and shame,
And rapine and consuming flame!"

"Ay," said the rubies, glowing red—
"There comes new life from life-blood shed
And though the Goth o'er-ride the Gaul,
Eternal justice rides o'er all!
Might may be Right for its own short day,
But Right is Might for ever and aye!"

"Ay!" said the diamonds, tongued with fire,
"Grief tracks the pathways of desire!
Our Kaiser, on whose head we glow,
Takes little heed of his people's woe;
Or the deep, deep thoughts in the people's brain
That burn and throb like healing pain.

"Thinks not that Germany, joyous now,
Cares nought for the crown upon his brow,
But much for the Freedom wooed, not won,
That must be hers, ere all is done—
That gleams, and floats, and shines afar,
A glorious and approaching star!"

"Ay!" said they all—with one accord,
"He is the Kaiser, King and Lord—
But kings are small—the people great—
And Freedom cometh—sure, thought late—
A stronger than he shall cast him down!"
This was my dream of the Kaiser's crown.
—Charles Mackay.

In business such a spirit as prevails in those who control the wealth of any country, that the law of the survival of the fittest must prevail, and that "unto him that hath shall be given," is good business must come a severe reckoning. Let every one be filled with that true spirit of brotherhood, ready to do right even at a loss to oneself. This is the spirit that wins and wins lastingly—the real true spirit of success and victory.

WAR WASTE AND WAR THRIFT

WAR is a waste. When great cities are destroyed, when ammunition which has required the labor of countless men to manufacture goes up in smoke, when millions of tons of food are consumed by armies which are not creating any useful product in return—in a word, when civilization is pouring its best into the all-devouring maw of war and destruction, there can be only one conclusion: waste is being practised on a scale so huge as to defy imagination.

War is waste; but the Allies' war is a justifiable, a necessary waste. It is justifiable and necessary because of the end to be achieved—the liberation of the little peoples and the protection of the weak from the oppression of the strong. In the waste of such a war, the Allies may properly glory. They have no reason to be ashamed.

But if the sum total of the empire's well-being is to be maintained, *there must be,* for the war-waste, *a compensating war-thrift.* The man at home must save, if the man at the front is to be enabled to "carry on." Canada will come out of the war strong and untrammelled in proportion as her people (by self-denial and sacrifice, as well as by the adoption of non-wasteful habits of life) save for their country an inheritance which will go to counterbalance the unavoidable waste of a righteous war.

STOPPING THE WASTE.

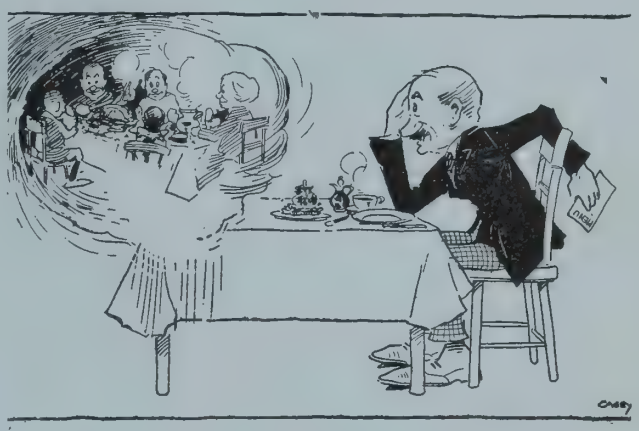
BIG concerns everywhere are giving much thought to the elimination of the waste and utilization of all the by-products. Chicago is famous for using all the pig but the squeal. The Pennsylvania Railroad requires that every bolt and nut that can be retapped be used. You will find no waste iron around their yards. Even the cotton waste used in wiping engines is cleaned and used for packing journals. In the South the stumps of yellow pine, heretofore a nuisance and an encumbrance to the land, are now turned into resin, turpentine and other by-products. Canada needs to learn the lesson of Thrift.

A Vision of Former Dinners

WHEN we go out to eat these days we have to sit and wonder, if food controller's hit the list with lightnin' and with thunder, or if he's put some more laws on to choke us from our hash, or if he's took from us our oats, our hay and our bran mash.

And when I see the sugar lump I sit and heave a sigh, for you could stick the bloomin' thing right edgeways in your eye.

And likewise bread is trimmed up thin, and butter, oh by heck, there aint enough doled out to grease the hair upon your neck.



Oh, I like to sit in times like these, and back up twenty years, to them there days what come along and boot away my tears—to the good old days of harvest homes when tables used to groan, and when we ate full to the neck for a quarter of a bone.

We used to take the punkins then, the corn stalks and the beets, and decorate the church throughout, the pulpit and the seats.

And put the big potatoes there, likewise the apples red, and cabbages as big and hard as was the deacon's head—and twine the oak and maple leaves, and spin the golden rod, and have a sample of most things what sprung from out the sod.

And then we had the harvest home—come back once more that night—when stuff to eat was piled up high and tucked in good and tight.

We ate some turkey and some ham, some chicken and some pie, we had a heap of sandwiches heaped up both thick and high. We ate, we did, until we groaned, and then we ate some more, and every course that came along we hollered out "encore!"

And after all that there was done they'd clear away the wreck, and all the preachers round about would climb upon the deck, and tear off jokes ten years of age and try to speechify on top of fourteen kinds of meat and sixteen kinds of pie.

There weren't no food controller then a-hangin' round the place, to see how much you gathered up and shoved into your face.

I'd like to be a kid again just for one harvest home, with sawhorse tables loaded up until they'd creak and groan—with punkin pies and chicken too, with home cured country ham, and best of all, by jing, there weren't no food controllin' man.—ARK.

Overhead and Merchandising

Why Sanitary Engineers Do Not Succeed as They Should—The Sale of Goods and Its Effect Upon the Problem of Overhead Expenses—Fixed Charges a Better Term Than Overhead

By A SALESMAN

IN the first place I want to say that I am not engaged in the plumbing business though I know considerable about the work and know just why plumbers do not succeed, and why they never will succeed until they as a whole become merchants. Not only must they learn something of the art of selling goods but they must also become more efficient in selling their service. They must be more like the lock experts of which the following story is told and as it is an old story, and one that is said to have occurred many years ago, we will relate it by beginning it in an old-fashioned way:

"Once upon a time there lived a banker in a small, small town. He had the misfortune to lose, or forget the combination of the bank safe, and could not open the safe no matter how he tried. It so happened that this small, small town was somewhat of a pleasure resort, and it also happened that a great lock and safe expert was at that time staying in that town. Well, the banker at once hied him to the lock and safe expert and told of the trouble he was in, and asked if the expert would help him out by opening the safe, and off they went to the bank, and in a few minutes the safe door was open and the expert wrote the combination of the safe on a piece of paper and handed it to the banker.

The banker did not know how to repay the expert for the good turn and said, "Well now, what do I owe you for this favor you have done me?" The expert replied that his charge would be $100. The banker thought that was an awful price and at once said that he would have to account for the $100, and would the expert make out a detailed bill, which request was promptly complied with in the following manner:

Bank Manager of Comfortville:—
To opening safe .....$ .10
To knowing how..... 99.90

Total....$100.00

There is surely a moral in that story for every sanitary and heating engineer and if every member of the trade were better salesmen, there may be a brighter outlook in store for the trade. If they knew how to sell service as the lock and safe expert knew, but they don't, and therefore thehy must sell goods and they must make a profit on the sale of those goods too.

The question is this, if the trade were to take to merchandising and larger volume of goods passed through their hands, these goods sold would, if properly priced, assist considerably in reducing what we term as overhead expenses. Just to illustrate the point I will relate an actual experience with a member of the craft some time ago. He had quite a big stock of goods on hand, several thousand dollars' worth, and there was very little building going on, and he had one or two men in his employ that were likely to have to be laid off. I was in that town and could not leave until early next morning, so we got on talking about overhead expenses, etc. Finally I said that if I were he I'd reduce the stock. This brought out a statement to the effect that if he could sell off the stock he had at the prices he had placed on them that the margin between his invoice price and what he would get for the goods would wipe out his overhead expenses for the period of one whole year.

Remember this man was not a merchant or he would in the first place never have held such a big stock for so long a period, and in the second place had he been a merchant he would never have made such a statement. I told him so too.

However, I advised him to take another course, and get rid of the goods, I asked him to conduct a sale of these plumbing goods and price all the goods down on the basis of selling the lot in one month. "One month," he exclaimed. "Why, if I could sell that lot off in one month, and get the work of installing them, I'd need 10 men to do the work."

"Never mind the 10 men for the present," I replied, "let's cross one bridge at a time, and sell those goods in a month," and before I left his store that night I had planned out a selling campaign which was strictly adhered to.

The only thing that did happen was that some lines sold out before others did, for example, closet seats sold like hot cakes, did not need any installing, quite a number of cast iron enamelled sink drain boards sold well and other items which did not need men to install them, such lines had to be replenished, but one way and another, nearly twice the value of goods in stock was sold in two months.

Now, what did that mean? It simply meant that in the first place this sanitary engineer had to in the first place put on 30 per cent. on his goods because his stock did not move fast enough, and that to make these goods move faster, to encourage sales, one must plan to sell a certain quantity of goods per month, or per three months, and in case the goods were not moving as fast as anticipated something must be done to get rid of the goods. It seems ridiculous on the face of it to see the way plumbers try to plug along year in and year out, and if the question of selling goods is referred to some of them say, "But look at —— the departmental store, I can't sell at their prices. I would only be left a margin of about 10 per cent., and 10 per cent. is no use to me." Well, now let's reason this out, I have replied.

Have you ever asked yourself how it is that a banking house very seldom charges more than 6 per cent. interest, and yet very few of our banks pay less than 12 to 14 per cent. dividend to their stockholders? These banks only sell or loan money, they don't gamble or risk their shareholders' money in 12 and 14 per cent. ventures so as to be able to make that amount of profit.

Here's the idea: quick sales and small returns means more profit. The departmental store which my friend referred to turn their whole stock over, at least its value, in about a period of three months. Now it would be the height of foolishness for the directors of that departmental store to say, well it costs us 30 per cent. overhead, using the same argument as my plumber friend, and we must add that much on to every article we sell because if their stock was turned over four times a year it would be equal to a matter of 120 per cent. The question is this. Merchandising costs must be based upon first the amount of money invested in goods for sale, or rather the stock required to have on hand at one time; second, upon the period it takes to turn that stock over; third, every item of cost directly incurred as a result of carrying that stock. But at the same time some method should be adopted to keep stock moving as actively as possible, and in that way a decrease in overhead expenses will result.

Overhead or Fixed Charges

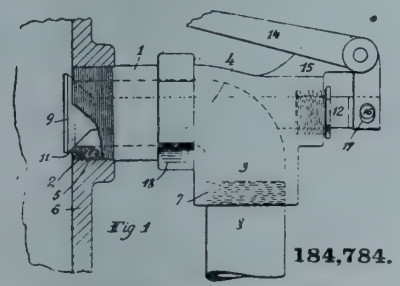
I have often asked myself how it is that very few people really know what it costs them to do business. This applies not only to the plumbing trade but even to the manufacturers of goods, and though it may sound bold, I venture to say that even they do not know how to arrive at their cost of doing business. If they did they would be in a more prosperous condition than they are to-day. I know of a number who have to do some pretty tall thinking when a balance sheet is being struck to make it look anything like rosy, and I venture to say that if they would take the advice of some of their own accountants some startling figures would be given them. There is, however, one thing which very few of the trade, either manufacturers or tradesmen, asw themselves, and that is. What do I mean by overhead expenses?

For example, the boss very seldom puts his salary down as overhead, or even the salary of the stenographer, or foreman, but such salaries are items of overhead. They are sums of money that must be paid whether there is $1 or $1,000 or more of business done. They are "fixed charges." Yes, there is a more specific term, "fixed charges." Charges that are fixed, charges against the business which must be paid, and the only way to determine what overhead expenses are is to think up every fixed charge, or amount of money that must be paid, no matter what the volume of business done may be. Very well then, to reduce the per cent. of fixed charges per dollar of business done must be to increase the volume of business and keep charges fixed. The only way this can be done is to increase sales, and this will never be done if fixed or overhead charges are added to every fixture or piece of goods on a yearly cost basis. Goods must not be kept in stock too long or else they eat up the profit or that margin which should be profit. Therefore it will be plainly seen that the best and most logical way to reduce overhead is to become a merchant and sell goods, turning them over three, four, to five times a year.

New Canadian Patents

Peter Bowman Bird, New York City, and Charles Adams Bird, Mount Vernon, both in New York, U.S.A., 11th June, 1918; 6 years. Filed 5th March, 1917. Receipt No. 276,520.

Claim.—1. The combination with a boiler, of a valve casing communicating with said boiler, a movable valve member disposed within said boiler adapted to be closed under pressure of the medium of the boiler, a stem for said movable valve member extending through and exteriorly of said casing, a lever for reciprocating said movable valve member solely in a longitudinal direction, fulcrum means for said lever, means for removably connecting said lever with said fulcrum means, and means for connecting said lever with said stem exteriorly of said casing, said connecting means including an angular element affixed to said stem.



184,784.

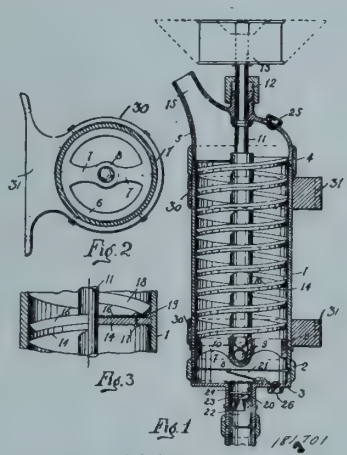
Blow-Off Cock for Boilers.

2. The combination with a boiler, of a valve casing communicating with said boiler, a movable valve member disposed within said boiler and adapted to be closed under pressure of the medium of the boiler, a stem for said movable valve member extending through and exteriorly of said casing, a lever for reciprocating said movable valve member solely in a longitudinal direction, fulcrum means for said lever, means for removably connecting said lever with said fulcrum means, and means for connecting said lever with said stem exteriorly of said casing, said connecting means including an angular element affixed to said stem, and a fork element affixed to said lever.

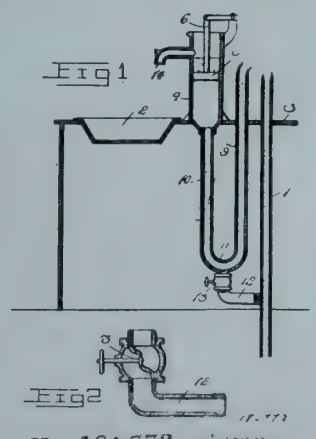
No. 184,701.

Joseph Edgar La Brie, Gadbout, Quebec, Canada, 4th June, 1918; 6 years. Filed 31st March, 1917. Receipt No. 277,810.

Claim.—A water pump comprising a casing, a ring secured within said casing, radially extending arms formed with said casing, a thrust bearing carried by said arms, a shaft journalled within said casing and having one end supported upon said thrust bearing, a spiral piston arranged within said casing and carried by said shaft, a plate secured to the upper face of said piston, the outer edge of said plate being turned upwardly, packing arranged between the upwardly turned edge of said plate and the upper face of said piston, and said casing having an inlet and an outlet, substantially as and for the purpose specified.



No. 184.701. Pump.

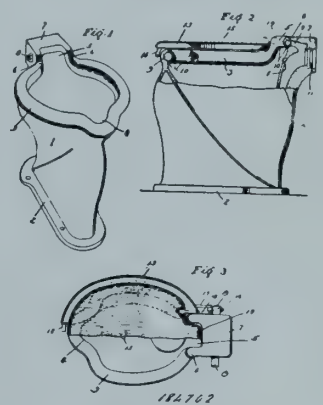


No. 184,772.

No. 184,772.

Philibert Boufard, and Ludger Roy, assignee of a half interest, both of Bromptonville, Quebec, Canada, 4th June, 1918; 6 years. Filed 9th April, 1918. Receipt No. 293,364.

Claim.—The combination with a pump having a reciprocating piston arranged therein, a supply pipe, a pair of vertical pipes, a bend connecting one of said vertical pipes with the upper end of said supply pipe, said bend being arranged on the same level as said pump an elbow connecting the lower ends of said vertical pipes, one of said vertical pipes communicating with said pump, of an auxiliary pipe formng a means of communication between said elbow and said supply pipe and a valve arranged within said auxiliary pipe, substantially as and for the purpose specified.



No. 184,702. Toilet Bowl.

No. 185,702.

Harry T. Lally, Jr., Alameda, California, U.S.A., 4th June, 1918; 6 years. Filed 8th April, 1918. Receipt No. 293,352.

Claim.—1. A toilet bowl, a roll rim around the upper edge of said bowl, said rim being curved upwardly and rearwardly and provided with a recess at the back of said bowl, the rear surface of which is above the plane of the bottom of the main portion of the rim, and a pivotally supported lid having a tongue extending into said recess.

2. A toilet bowl, a roll rim around the upper edge of said bowl, said rim being curved to form recesses at the front and back of said bowl, a seat comprising two parts separated at the front and back, a lid. a tongue on said lid extending into said back recess, and a hinge connection for said seat and said lid.

3. A toilet bowl. a rearward extension

(Continued on page 34)

PRACTICAL SHEET-METAL WORK

THREE PIECE ELBOW WITH GUSSET OR GORE PIECE.

BY THOMAS STANSFIELD

IN the accompanying drawing there are two articles shown which are not very often made these days. Fig. A being that of a hip bath tub, the other a kitchen colander. The developing of the patterns for both these articles will not only prove interesting, but will be splendid practice.

The first step to make in developing Fig. A will be to draw line A. B. Now determine the width and the depth of the bath required, with A B as centre. Next draw an elevation C D E F and extend the base line from E F to centre, this may be at any point on line A B until G is determined.

Now draw a half plan of the bottom with H as centre and divide same into 8 equal parts 1, 2, 3, 4, etc.

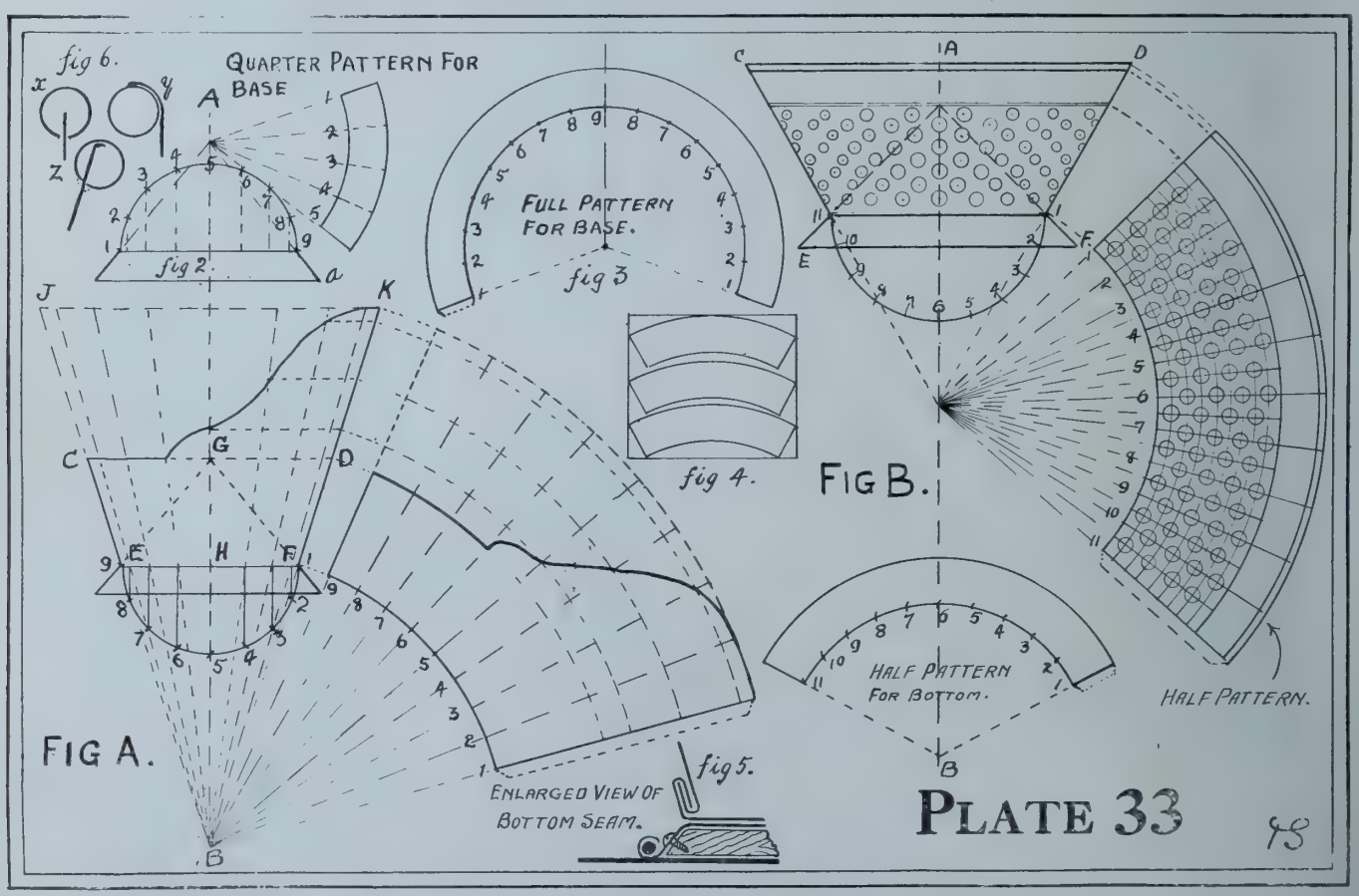
The stretchout for body is next. With B as centre open compass to K, and draw a circle; then draw another circle from F sufficiently large to allow the transferring of the measurements from the half plan, and erect perpendicular lines on half plan from 2, 3, 4, 5, 6, 7, 8 until they reach line E. F. From these points draw a number of slant lines using B as centre, and J K the top line. Wherever these slanted lines intersect the curved outline of the sides of the bath, draw a number of lines to back.

With B as centre, draw a number of circles from these points just developed; then draw lines, still using B as centre, which will cut the circles at points, 9, 8, 7, 6, 5, 3, 2, 1. Now draw a solid line with the compass, with B as centre and D as radius, from 9 to 6. Then draw another solid line through the various intersections, beginning at 1, until 6 is reached, in manner shown. This completes the half pattern for the body.

At any convenient point on line A B, as shown in Fig. 2 near A, draw an elevation of the flared bottom, and again draw a half plan, dividing in manner already described. From the centre draw two circles, using 9 and a as radius respectively, and transfer measurements 1, 2, 3, 4, 5; this will be sufficient for a quarter pattern.

Fig. 3 shows a whole pattern. The student will note that to make this pattern in one piece, a large sheet of material would be wasted, whereas by making a quarter pattern a small sheet can be utilized with very little waste. This is proven in Fig. 4.

The seaming of the flared base and bottom is described in Fig. 5.



What More Can We Do to Win War?

Some Splendid Questions Put to Every Member of the Trade — Factory Sanitation Referred to Work of the Trade Can Prevent Enormous Loss in Men and Money

By ARTHUR BATEMAN, Head of Sanitary Department, American School of Correspondence.

MR. President and fellow members: Sanitary engineers in this and other countries have played a potential part in helping to crush hunism for ever, but to-day, surging uppermost in every member's breast is the fervent desire to do something more to subdue and punish the murderous bullies who have destroyed kingdoms, raped women, assassinated the innocent, demoralised commerce, and outraged every law known to liberty-loving countries. What further help can we render our country in her hour of need? What can we do from now on to beat autocracy to a pulp and smash to fragments the relentless sword of militarism in the most thorough manner, and in the shortest possible time?

Our first thought is with the men who are winning the battles, and some of us can enter the service and do much to stamp out disease and keep the army in perfect health. In previous wars disease killed more men than bullets. The mortality rate in the Mexican War of 1847 was 100 per 1,000 per year. In the Civil War in 1862 there were 40 deaths per 1,000, but the following year the rate increased to 60 per 1,000. A decided improvement was shown in the Spanish-American War of 1898, yet 25 soldiers out of every 1,000 died each year. These figures were further improved during the Russo-Japanese War of 1904, and fell to 20 per 1,000 per year. In the Boer War, 1889 to 1902, Britain lost in deaths from wounds 6,965 N.C.O.'s and men, whereas 13,590 died from disease, and 72,551 were invalided back to England. For every soldier admitted to hospital for wounds, 17 were admitted for disease. There were 57,000 cases of typhoid fever and 8,000 deaths.

Compare these figures with those reported by our Surgeon-General last month. They cover 3,000,000 men, many of whom are in the first line trenches and sleeping and eating any way they can, while those at home are under novel regime. It surely is splendid to learn that the mortality rate of the entire army is only 2-18, whereas the death rate of men in civilian life of military age is 6-7. In other words the army deaths are only a third of civilian life, and it must not be forgotten that it has oftentimes been a case of making bricks without straw. The sanitary engineers have had to make countless appliances out of any old waste products and make the most of the scanty supplies at their disposal. We all feel proud of their accomplishments, but what more can we do to further reduce the mortality rate? Can we get into active service? What branch of the service are we best fitted for? What can we do to help the cause in or around the cantonments at home?

Obviously, we cannot all join the army, but every member must strive his utmost to eliminate the constant sickness among our workers at home. A country's health is its wealth and it is our bounden duty to keep the workers in essential industries in perfect health at this time. There are 1,000,000 workers in this country sick all the time which is a very serious drain on us, and conditions are likely to become worse for every industry is working under intensive pressure, and the hours are longer for the workers. We must do something along sanitary lines to eliminate this sickness.

Recent statistics show that there are always 3,000,000 sick persons in the United States, of whom 1,000,000 are in the working period of life, and that about three-fourths are actual workers earning an average of $700 a year, the loss through sickness being over $500,000,000. To this must be added another $500,000,000 as the expense of medicines, medical attendance, special foods, etc., bringing the total cost of illness up to $1,000,000,000. The loss from death is estimated at $1,000,000,000 which added to the estimated preventable loss from illness $500,000,000 gives one and one-half billions as the preventable loss from disease and death in this country.

It will be gathered from these figures that, if from 2½ to 3 per cent. of the working population are constantly sick, this is equivalent to a loss of about nine working days per person per year of 300 working days for the entire population. This rate applied to the whole country gives figures that are staggering, and we can ill afford this huge loss these days when the Government is crying out for physically fit men and women, as well as money. What can we do collectively and individually to prevent all this sickness? Can we improve our sanitary codes? Can we impose more rigid restrictions on factories and workshops? Instead of waiting for a complaint to be lodged, can we not offer practical suggestions and advice to factory and works managers, which would put money into their pockets, help the Government very materially, and bring greater health, comfort, and happiness to the workers?

One case in point is a large mercantile concern in Baltimore. They rented an up-to-date building, but the first two winters brought about a percentage of sickness of 27½ among the employees. They discovered that it cost them twenty-four dollars every time an employee caught cold, and realizing that colds were brought about by inefficient ventilation and heating, they called in a sanitary and heating engineer, who rectified the defects in the heating and ventilation plant and the percentage of sickness fell to 7, or a reduction of 75 per cent. There are millions of similar cases throughout the country. What are we going to do about them?

Each succeeding winter, Petromortis claims more victims and we must not lose valuable lives and have avoidable sickness these days. Petromortis is brought about by inhaling the poisonous fumes of gasoline in inefficiently ventilated and drained garages. What can we do to conserve our man power in this respect?

Now that the greater part of the world relies upon the United States for food stuffs it must be our ardent endeavor to conserve the lives and keep in perfect physical fitness our agricultural workers. We are well aware that farm sanitation in the agricultural countries is deplorable. In a sanitary survey made by the Indiana State Board of Health some time ago, 206 farm houses were classed as sanitary, and 1,068 insanitary. Similar conditions prevail in almost every rural district. How can we make the very necessary clean up, and how soon?

What more can we do to help win the war by conserving man power, health, fuel, foods and materials? Can we not standardize all traps, pipes and fittings which will save materials, labor and money? We can learn something from Europe in this respect. For example consider their drainage. In the year 1907 the Associated German Architectural and Engineering Societies, those of Berlin, Cologne, Frankfurt-on-the-Main, Prague, Vienna and Paris put into force their standard regulations which reduced their 60 types of straight pipes and 250 specials to 30 and 150 respectively.

Another item of vast importance to all sanitary engineers is the conservation of fats. Glycerine is made from fats and glycerine is needed for munitions. A recent investigation in the Government cantonments and training stations showed that 80,000 pounds of fats were lost through the drainage system each week. These figures are for approximately 2,000,000 men. If fats are wasted at a similar rate throughout this country with its 100,000,000 population we will turn into the sewers 208,000,000 pounds of fat in the course of a year. Again sewage containing much fat is more difficult and costly to treat. That's not conservation.

What are we going to do about it?

These are just a few of the all-important problems confronting us. Will you discuss them freely so that we may all be better equipped to do more to help win the war?

Sanitary Drinking Fountain

Winnipeg Health Department Takes Interest in Sanitary Drinking Fountains—Adopts an Entirely New Type—Some Important Points Discussed—The Common Drinking Cup Must Not Be Used in Winnipeg

By One of Us

IN the June, 1917, issue of Winnipeg's "Health Bulletin," published by the Winnipeg Health Dept., an article appeared dealing with drinking fountains, and pointing out how very objectionable and insanitary the bubble fountain had proved to be in the experiments carried out at the Universities of Wisconsin and Minnesota. At the later university 77 fountains in all were examined, 65 per cent. were continuous flow type and 35 per cent. were intermittent and operated by the consumer. The nozzles all discharged vertically. The height of the water jet above parts of the fountain that could be touched by the lips of the consumer was less than one inch in 40 per cent. of the fountains. All were found to be subject to contamination by the lips of persons using the same, either directly by the lips, or by water falling back from the lips on to the jets, or surrounding parts. Certain of the types have closed receptacles around the point of discharge, which retain a part of the water discharged from the outlet. This was demonstrated by means of coloring matter placed in these receptacles and which was not entirely removed for long periods. The principal defect was the vertical discharge of water from the fountain. This made it necessary for the consumer to place the mouth directly over the point of discharge; in fact the majority of persons drank with the lips touching the nozzle, especially when the water jet was low.



Bacteriological

The bacteriological examinations of the swabs of the nozzles of the fountains showed that 80 per cent. were infected with streptococci—an organism commonly found in abundance in the mouths of human beings.

In the same article the writer states, "we have not yet seen a really satisfactory drinking fountain, in fact many of those in use are anything but satisfactory." and he also says, "in any type adopted we should like to see three things, viz.:—

(1) A guard or ring which would absolutely prevent the lips of any persons using the fountain from coming in contact with the orifice of the fountain.

(2) A jet should be devised which instead of rising and falling vertically, would be thrown off at an angle, and so fall entirely clear of the orifice from which it proceeds.

(3) That the pressure should at all times be sufficient to throw a jet which can be seen, and from which water can be taken into the mouth without sucking or drawing at the orifice.

We find that this desire for an improvement in drinking fountains is not confined to any one district, or State of this continent. In the July issue of the "Water and Gas Review," New York, there is published a progress report of the committee on Sanitary Drinking Fountains, read before the Iowa Section of the American Association of Engineers at its meeting, Oct. 10-12, 1917, held at Council Bluffs.

Part of their report reads, "In order to demonstrate the need of mouth guards your committee employed an observer to inspect the use made of two fountains without mouth guards. One fountain was of the continuous flow type with a bubble five-eights of an inch in height. It was located in a public library. During the period of observation 59 persons drank from the fountain, 22 of whom were children and 37 adults. Of the 22 children, 15 placed their lips upon the metal top of the bubbler in drinking, while 7 did not. Of the 37 adults, 28 placed their lips upon the metal top, while only nine did not. **One adult had an eruption upon the face, and one was apparently in bad general health.**

It seems therefore that we are justified in demanding that all drinking fountains should have suitable mouth guards, that the vertical bubbler, whether of the continuous or intermittent flow type should be condemned as dangerous.

The Winnipeg Health Dept., on learning of the experiments carried out at the Universities of Wisconsin and Minnesota immediately investigated the matter and being unable to find a drinking fountain that would meet their requirements (especially as only a few months before the common drinking cup had been prohibited by Provincial legislation), called in the representative of one of the largest manufacturers of plumbing and sanitary goods in Canada. The requirements laid down at first seemed almost insuperable, but after months of thought and experimenting, a fountain was finally evolved—a **"Drinking Fountain"** which fully met all requirements, and is absolutely safe from any of the menaces enumerated in connection with the bubbler type of fountain.

It is made in such a manner that the water is thrown off at an angle instead of vertically, and the party drinking does not drink any water which has touched the lips of the previous drinker. The most difficult problem presented was to take care of the variation of pressure, as with a side throw action this was very important, but finally this was overcome by delivering the water under gravity so that the size of the stream never varies and the excess pressure is wasted into the bowl of the fountain. In the experiments the fountain worked satisfactorily with a variation of water pressure from 15 to 100 lbs. and without adjustment.

The first of these drinking fountains was placed in the City Hall, Winnipeg, about 10 months ago, and although minor changes have been made in it from time to time, it has invariably given satisfaction. More recently one was placed on the street at a point some three miles from the centre of the city, in a working class district, and it has proved absolutely satisfactory, and is as nearly fool proof as a street drinking fountain could be.

So satisfactory has this drinking fountain been to the Winnipeg Health Dept., that they published in their 1917 annual report (see pp. 47 & 48) the

following unsolicited testimonial under the head of Drinking Fountains:

"Continuing our investigations of last year we were instrumental in having a sanitary drinking fountain placed on the market which appears to fulfill the requirements for a truly sanitary fountain. The jet has a horizontal instead of a vertical flow and the orifice is protected by a guard ring which prevents the lips of any persons drinking therefrom from coming in contact with the pipe. All the water gets clear away and cannot fall back into the pipe. The fountain can be attached to the bowl of any existing fountain. The flow of water is regulated by a piston, and fluctuations of pressure are guarded against by an automatic regulator inside the fountain so that the pressure is uniform at all times. One of these fountains may be seen in operation in the Winnipeg City Hall corridor.

Unlawful to Bathe in 1843

The Bath Tub Evidently Had a Struggle in Those Days For Its Existence, According to the Following Article From the New York "Mail"

BATHTUBS are so common to-day that it is almost impossible to imagine a world without them, says the New York *Mail*. And yet the first American bathtub was installed and dedicated so recently as December 20, 1842, and, for all I know to the contrary, it may be still in existence and in use.

Curiously enough, the scene of its setting up was Cincinnati, then a squalid frontier town. But Cincinnati, in those days, as in these, contained many enterprising merchants, and one of them was a man named Adam Thompson, a dealer in cotton and grain. This trade frequently took him to England, and in that country during the '30s, he acquired the habit of bathing.

The bathtub was then still a novelty in England. It had been introduced in 1828 by Lord John Russell, and its use was yet confined to a small class of enthusiasts. Moreover, the English bathtub, then as now, was a puny and inconvenient contrivance—little more, in fact, than a glorified dishpan—and filling and emptying it required the attendance of a servant. Taking a bath, indeed, was a rather heavy ceremony, and Lord John in 1835 was said to be the only man in England who had yet come to doing it every day.

Thompson who was of inventive fancy —he later devised the machine that is still used for bagging hams and bacon —conceived the notion that the English bathtub would be much improved, if it were made large enough to admit the whole body of an adult man, and if its supply of water were admitted by pipes from a central reservoir and run off by the same means.

There was then, of course, no city water supply, at least in that part of the city, but Thompson had a large well in his garden, and he installed a pump. This pump, which was operated by six negroes, much like an old-time fire engine, was connected by a pipe with a cypress tank in the garret of the house, and here the water was stored until needed. From the tank two other pipes ran to the bathroom. One carrying cold water, was a direct line. The other, designed to provide warm water, ran down the great chimney of the kitchen and was coiled inside of it like a giant spring.

The tub itself was of new design and became the grandfather of all the bathtubs of to-day. Thompson had it made by the leading Cincinnati cabinet maker, and its material was Nicaraguan mahogany. It was nearly seven feet long and fully four feet wide. To make it watertight, the interior was lined with sheet lead, carefully soldered at the joints. The whole contraption weighed about 1,750 pounds, and the floor of the room in which it was placed had to be reinforced to support it. The exterior was elaborately polished.

In this luxurious tub Thompson took two baths December 20, 1842, a cold one at 8 a.m. and a warm one some time in the afternoon. The warm water, heated by the kitchen fire, reached a temperature of 105 degrees. Christmas Day, having a party of gentlemen to dinner, he exhibited the new marvel to them and gave an exhibition of its use, and four of them, including a French visitor, Colonel Duchanel, risked plunges into it. The next day all Cincinnati had heard of it, and the local newspapers described it at length, and opened their columns to violent discussions of it.

On the one hand it was denounced as an epicurean, and obnoxious toy from England, designed to corrupt the democratic simplicity of the republic, and on the other hand it was attacked by the medical faculty as dangerous to health and a certain inviter of "phthisic, rheumatic fevers, inflammation of the lungs, and the whole category of zymotic diseases."

The noise of the controversy soon reached other cities, and in more than one place medical opposition reached such strength that it was reflected in legislation. Late in 1843, for example, the Philadelphia Common Council considered an ordinance prohibiting bathing between Nov. 1 and March 15, and it failed of passage by but two votes. During the same year the Legislature of Virginia laid a tax of $30 a year on all bathtubs that might be set up. In Hartford, Providence, Charleston and Wilmington, Del., special and very heavy water rates were levied upon those who had them. Boston early in 1845 made bathing unlawful except upon medical advice, but the ordinance was never enforced and in 1862 it was repealed.

Create New Business

There is nothing like looking round and finding out those who can afford to have a good job done, and who have the money to pay for it. They may pass you up the first few times you call, but if you are in earnest, and have a reputation for doing good work, never fear, the work will soon come along, and both you and your customer so won over will be everlasting friends. Of course, a reputation must first have been established for good work, otherwise there is no true foundation upon which to build up a business.

One of the reasons why members of the plumbing trade as a whole are looked upon as more or less of a joke is because of the fact that the trade have not mixed sufficiently with the public, have not met members of the public on common ground, have not catered or rather canvassed for new business. The article which appeared in SANITARY ENGINEER June 1st issue, on page 13, is full of good food for serious thought. As far back as 1914 a method was shown how a sanitary engineer could meet his customer on common ground. How the sanitary and heating engineer could show a little more than common interest in a customer's welfare, by taking note of the condition of fractures, etc. Then at a later date showing that customer how money could be saved and service rendered by having certain repairs made or new fixtures installed. Sanitary engineers have been too apt to be "Micawber-like," "waiting for something to turn up," and when it did turn up it would prove nine times out of ten that the work was not profitable.

Just imagine that firm of sanitary and heating engineers in the United States who followed out the second method referred to in the article in

Continued on page 34

Market Conditions and Tendencies

Statements Regarding the Prices and Trend of Supplies.

THE MARKETS AT A GLANCE

METAL markets are decidedly quiet. The signing of the armistice has had the effect of curtailing trading to some extent and on this account there is little to report this week. However, a lower price on antimony is now effective from that shown in last issue, while tin has stiffened from low level reached a couple of weeks ago. Antimony is, of course, essentially a war metal and that even lower levels will be reached seems probable.

An advance has been recorded in values. New discounts issued show quotations now ranging from five to ten per cent. above former levels. This it is estimated is the result of the scarcity of raw materials combined with manufacturing costs which have been steadily mounting. The demand for steam goods is very good, representing a very satisfactory volume of business.

The undertone to the market on enamelware is decidedly firm. There seems to be every indication that higher prices are warranted in the face of conditions which have prevailed. However, whether action, if any, is anticipated will be deferred until some recovery from excitement of the past few days has been made. Whether the outlook is such that higher prices must be named almost at once is not information that could be secured definitely.

The situation in regard to getting supplies is one which can not be expected to show immediate improvement. It must be remembered that the war is not yet over and Government control and the priority or licensing system of distributing goods may well extend over a period of months. This means that supplies of sheets, pig iron, soil pipe, wrought pipe and boiler tubes must take a long period of time to accumulate to a point where it can be said they have reached a normal pre-war footing.

TORONTO, November 13.—Revised discounts have been named on valves, which provide for an advance. A very firm situation is shown in enamelware and it is intimated that higher prices are a possibility. Tin has stiffened slightly and antimony records a decline.

Range Boilers Firm, Unchanged

RANGE BOILERS.—The market on range boilers rules firm and unchanged. Supplies are none too plentiful, but most urgent requirements of the trade are being met. Prices hold without any change.

	Standard	Extra Heavy
30-gallon range boilers	$14.00	$17.00
35-gallon	17.00	20.50
40-gallon	20.50	24.00
52-gallon	28.00	32.00
66-gallon	37.00	42.00
82-gallon	45.00	50.00
100-gallon	62.00	70.00

Enamelware Rules With Firm Tone

ENAMELWARE.—The market rules with a very firm undertone and that higher levels may come seems possible. The signing of the armistice may mean an unchanged market for some little time, but conditions are said to warrant a higher scale of quotations.

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Basins, flat back, 14 x 15 in.	6 00
Do., corner, 15 in.	5 95
Sinks, roll rim, 18 x 30 in., staple	16 80
Closets, oak tank and seat	25 00
Do., enamel iron or white vitro tank	27 00

Soil Pipe Scarce; Market Firm

SOIL PIPE, FITTINGS.—There have been no new developments in regard to soil pipe. Scarcity of raw material will be a factor for many months to come it is estimated, and the manufactured article must reflect this condition. The market rules with a firm undertone at discounts shown herewith:

SOIL PIPE AND FITTINGS

Medium and extra heavy soil pipe, 2 in. to 6 in.	15%
Medium and extra heavy fittings, 2 in. to 6 in.	25%
8in. soil pipe and fittings	Net list

C. I. PIPE FITTINGS.

Cast iron fittings	Net List
Plugs	15%
Bushings	18%
Flange unions, standard	Net List
Dart unions, ¼-inch to 2-inch	15%
Do., 2½ in. and larger	6½%
Nipples, up to 4-inch	45%
Do., 4½-inch and larger	40%
Do., running thread 4-in. and under	25%
Couplings, 4-in. and under	35%
Do., 4½ in. and larger	15%

MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittgs., Class A, lb.	.60	.75
Do., Class B., lb. net	.27	.37
Do., Class C., lb. net	.19	.27

Valves Revised; Are Now Higher

VALVES.—The scarcity of material and increased manufacturing costs which have become so dominant a factor in the market situation have resulted in a revision of discounts practically all along the line. Present basis of quotations provides for an advance and the outlook seems to be for a steady maintained market for some time to come. Discounts now effective are:

	Discount off list
Ground work	40
Compression work, standard	45
High grade	41
Cushion work	40
Fuller work, standard	43
High grade	36
Basin cocks, No. 0 standard	38
Nos. 1 and 2	38
Bath cocks	48
Flatway stop and waste cock, standard	45
High grade	45
Roundway stop and waste cocks, standard	45
High grade	45
Brass steam cocks, standard add 10%.	
Globe, angle and check valves, standard.	Net
Do., removable seat	Add 5%
Radiator valves, standard	10
Do., removable seat	Net List
Patent quick opening valves	30
Basin Cocks—	
No. 0 and 1, Fuller pattern	43
Globe, angle and check valves, standard, medium pressure	20
Radiator valves, standard med. pressure.	30
Radiator valves, removable seat, medium pressure	25

Waste Steady; Oakum Unchanged

WASTE, OAKUM.—There is nothing new to be said about waste. Supplies are very good and the demand is maintained at a very satisfactory level. Prices are firm and unchanged. Similar conditions may be said to apply to oakum, which is moving quite well and ruling with a firm undertone.

	Per 100 lbs.
Best American	$21 00-$22 00
Clipper, spun	- 21 00
Do., unspun	- 10 50
Plumbers', spun	10 00- 10 50

Wrought Pipe Supplies Light

WROUGHT PIPE.—Wrought pipe is scarce and manufacturers generally are operating away behind schedule. It is understood that the United States War Trade Board's allotment of steel to pipe manufacturers has been 30 per cent. normal requirements, and whether this can be improved upon for some time seems to be a question. At any rate, the market is bare of pipe for immediate delivery and improved conditions are hardly looked for this year.

WROUGHT IRON.
Price List No. 37—September 11, 1918
Standard Buttweld

	Steel		Gen. Wrot. Iron	
	Per 100 feet			
	Blk.	Gal.	Blk.	Gal.
⅛ in.	$ 6 00	$ 8 00	$.....	$.....
¼ in.	5 22	7 35	5 52	7 65
⅜ in.	5 22	7 35	5 52	7 65
½ in.	6 63	8 20	7 06	8 71
¾ in.	8 40	10 52	8 97	11 09
1 in.	12 41	15 56	13 26	16 41
1¼ in.	16 79	21 05	17 94	22 20
1½ in.	20 08	25 16	21 45	26 54
2 in.	27 01	33 86	28 86	35 71
2½ in.	43 29	54 11	.....	.....
3 in.	56 51	70 76	.....	.....
3½ in.	71 76	88 78	.....	.....
4 in.	85 02	105 19	.....	.....

Standard Lapweld

	Steel		Gen. Wrot. Iron	
	Blk.	Gal.	Blk.	Gal.
2 in.	$ 31 82	$38 30	$33 70	$40 20
2 ½in.	47 97	58 21	50 90	61 10
3 in.	62 73	76 12	66 66	79 90
3½ in.	78 20	96 14	82 80	100 00
4 in.	92 65	114 00	98 10	119 00
4½ iu.	112 00	137 00	125 00	149 00
5 in.	130 00	159 00	145 00	174 00
6 in.	169 00	206 00	188 00	226 00
7 in.	219 00	268 00	243 00	292 00
8L in.	230 00	281 00	255 00	306 00
8 in.	265 00	324 00	294 00	353 00
9 in.	317 00	388 00	.....	.....
10 L in.	294 00	360 00	326 00	392 00
10 in.	379 00	464 00	420 00	505 00

Terms 2% 30 days, approved credit.
Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Boiler Tubes Decidedly Scarce

BOILER TUBES.—Boiler tubes record conditions unchanged. Stocks grow smaller but price is unchanged. What the result of signing of the armistice may be is just a ilttle uncertain. There must be a very heavy accumulation of orders, however, to be taken care of, and no immediate improvement in available supplies can reasonably be looked for.

BOILER TUBES—	Cold Drawn	Lapweld
1 inch	$36 00	$.....
1¼ inch	40 00	.....
1½ inch	43 00	36 00
1¾ inch	43 00	36 00
2 inch	50 00	36 00
2¼ inch	53 00	38 50
2½ inch	55 00	42 00
3 inch	64 00	50 00
3¼ inch	.....	58 00
3½ inch	77 00	60 00
4 inch	90 00	75 00

Sheet Situation Shows No Improvement

SHEETS, PLATES.—There is no improvement shown in the sheet situation. There have been a few cars arrive, but these are quickly absorbed and there has undoubtedly been a tightening of the lines drawn on commercial enterprises. Reports indicate that stocks of light galvanized particularly are about exhausted. Indications point to a disposition on the part of many buyers to hold off their purchases and even some cancellations have been reported, prior to signing of armistice. The consensus of opinion among the trade seems to be that this holding back is a more dangerous attitude than taking the goods for any man that wants the goods and can use them. The priorities now existing in the mills will it is thought continue in force for many months, as this would appear to be about the only method possible to handle acumulation of business. Quotations on galvanized sheets 28 gauge are up to $12.75 per 100 pounds in some quarters, and the 10¾ ounce, $13.50.

BLACK SHEETS—	Per 100 lbs.		
10 gauge	$.....	$10 00	$.....
12 gauge	.....	9 60	.....
12 gauge	.....	9 60	10 00
16 gauge	.....	8 50	8 55
18-20 gauge	8 05	8 30	8 80
22-24 gauge	8 10	8 35	8 85
26 gauge	8 15	8 40	8 90
28 gauge	8 25	8 50	9 00
3-16 inch plate	.....	10 00	.....
¼ inch boiler plate	.....	10 00	.....

Prices shown are for full cases. An extra charge of from 25c to $1 per 100 lbs. is made for less than case lots.

GALVANIZED SHEETS—			
10¾ oz.	$11 00	$12 00	$13 50
U.S. 28	10 70	11 70	12 75
U.S. 26		10 40	11 40
22 and 24		10 25	11 25
18 and 20		10 10	11 10
16		9 95	10 95
14		9 85	10 85

Prices shown are for full cases. An extra charge of from 25c to $1 per 100 lbs. is made for less than case lots.

Solder Outlook Unchanged; Lead Products

LEAD AND ZINC PRODUCTS.—No change is reported in the situation on solder. Tin has firmed up again somewhat and this has tended to stiffen the market on solder. The demand is just a little easier but is expected to show improvement. Lead products are moving out in only fair quantities and the market rules firmly at unchanged levels.

Lead pipe, lb.	....	0 15
Lead waste pipe, lb.	....	0 16
Lead traps and bends	....	Net list
Lead wool, lb.	0 14	0 15
Lead sheets, 3 to 3½ lbs. sq. ft., lb.	0 14¼	0 15
Lead sheets, 4 to 8 lbs. sq. ft.	0 13½	0 14
Cut sheets, ¾c. lb. extra and cut sheets to size, 1c. lb. extra.		
Solder, guaranteed, lb.	0 50	0 55
Solder, strictly, lb.	0 47	0 52
Solder, commercial, lb.	0 42	0 45
Solder, wiping, lb.	0 40½	0 50
Solder, wire, lb.	0 56	0 70
Zinc sheets, per lb.	....	0 26

Lower Prices on Old Materials Looked For

OLD MATERIALS.—Lower prices seem to be nearer on practically all lines of old materials. Buying interest is nil and a revision in prices which will provide for a decline is looked for.

Dealers' Buying Prices		
Tea lead	$0 05¼	$....
Heavy lead pipe	....	0 08
Yellow brass	0 12	0 13
Red brass	....	0 21
Light brass	....	0 09½
Heavy zinc	0 05½	0 06
Heavy copper	0 22	0 23
Stove plate, per ton	....	25 00
Old cast iron, per ton	....	30 00

Antimony Down 2c; Tin Stiffens

INGOT METALS.—A decline of two cents per pound in antimony has been recorded and a little stiffer feeling is noticeable in tin. Spelter holds firmly though there is little demand. No change is shown in the lead market, there being little or none available.

COPPER.—There is nothing being offered commercially and production is going into essential war work. Prices show no change at 30c to 32c per pound locally and conditions which prevail are featureless.

TIN.—The market has stiffened slightly, quotations ranging now around 90c to 95c per pound. Licenses to import are very hard to get but there seems to be some stock here and interest is rather lacking.

SPELTER.—There is no demand for this metal, but there is a firm undertone in evidence. Prices have held unchanged at around 11c per pound.

LEAD.—Supplies are practically nil if any at all are available commercially. The situation in the States is virtually Government controlled and it is indicated that no lower prices threaten. Locally quotations range nominally around 10½c to 11c per pound.

ALUMINUM.—Production is being directed to war work and there is nothing of interest to the trade. Quotations nominally range around 50c per pound.

ANTIMONY.—A decline of 2c per pound has occurred following a drop of 1c last week, bringing quotations locally down to 15c per pound.

Antimony is essentially a war metal and favorable war news and peace talk are factors which may be expected to bring prices down.

PIG IRON.—There has been no let-up in the demands of the Government and for this reason commercial enterprises have not gone up any higher on the list of those who may get iron. Production continues to be absorbed largely in war demands of one sort or another, and no change in the outlook is promised for the immediate future.

FRANK STOCKDALE ADDRESSES

Some time back quite a number of Toronto sanitary engineers attended the Convocation Hall to hear the Stockdale lectures on merchandising and a number of the MacLean trade papers published these lectures. There being such a demand for those issues which contained these lectures, it was decided to publish same in pamphlet form.

There are still a few copies left, and those desiring to become possessors of one may do so by dropping a postal to the editor SANITARY ENGINEER.

It may be stated that these lectures were addressed to a crowded hall, and without doubt are a masterpiece in the art of retail merchandising, and some splendid arguments were used in connection with the question of overhead expenses.



RECOVERING FROM "FLU"

The friends of Frederick Smith of Guelph will be pleased to hear that he is on a fair way to recovery from a severe attack of the "Flu." Mr. Smith is a member of the Ontario Society of Domestic Sanitary and Heating Engineers and is an enthusiast in society problems, conducting at the present a very nice sanitary and heating business in the City of Guelph.

BUSY MAN THESE DAYS

W. E. Russel of London is a very busy man these days. He not only conducts a successful plumbing and heating business, but is chairman of the Board of Health in London. He has had "some time" fighting the "flu" in his locality, but, like all the knights for the cause of prevention, he has succeeded.

ENDOWMENT FUND BUYS VICTORY BONDS

SANITARY ENGINEER got in touch with the worthy secretary of the Ontario Society, G. F. Frankland, and has been informed that the Endowment Fund has been used to help win, or at least, help pay for the war by investing same in Victory bonds. We reported in our last issue that the Society had the matter under consideration and we are pleased that the trustees of this fund saw fit to make this investment.

T. AIRD MURRAY DIES AT REGINA

T. Aird Murray of Oakville died in the Grey Nuns' Hospital at Regina, Sask., recently, from pneumonia, following an attack of Spanish influenza. Mr. Murray was born at Dumfries, Scotland, on June 3, 1866, the son of the late A. D. Murray of Newcastle-on-Tyne, England, and a nephew of the celebrated philologist of Oxford University.

After a distinguished career in Great Britain, Mr. Murray removed to Canada about ten years ago, and since that time had become recognized as one of the most eminent sanitary engineers in Canada. He was consulting engineer to the Saskatchewan Government, a member of the Canadian Society of Civil Engineers, Past Vice-President of the Canadian Public Health Association, a member of the American Public Health Association, a member of the Assiniboia Club of Regina and of the Engineers' Club of Toronto.

Three years ago Mr. Murray's only son died as a result of wounds received in France. He is survived by his wife, who at present resides in Oakville, Ontario.

Mr. Murray was a man well versed in many subjects and many of his engineering feats will long exist and be of service to the citizens of Canada. His genial nature and sterling worth endeared him to a wide circle of friends. Archdeacon Davidson of Regina, late of Guelph, conducted the funeral service, the interment taking place at Regina.

SUBSCRIBED TO VICTORY LOAN

SANITARY ENGINEER has a very pleasant piece of news for its readers in reporting that the Ontario Society of Domestic Sanitary and Heating Engineers created a special fund to be devoted to the Victory Loan. This is a splendid move on the part of the Society and especially so when we realize that a large per cent. of its members and their employees subscribed to the full 100 per cent. and were recipients of the honor flag.

The staff of the MacLean Publishing Co., of which SANITARY ENGINEER is a part, were among the first in Toronto to be awarded the honor flag, the firm making it possible for the staff to roll up a big amount by allowing payments to be spread over a period of one year, making no deductions from the interest coupons.

HOW TO HANDLE AND DEVELOP YOUR OWN BUSINESS

"How to Handle and Develop Your Own Business," produced and published by the A. W. Shaw Company, is timely, well handled, and especially helpful with so many employees now in government service. It gives tested and tried methods for handling a "one-man business"; it actually shows how to get started right and how to keep effective and simple records; it tells how to train employees; it shows how to write letters that pull, and letters that win back dissatisfied customers; how to advertise successfully; how to cut costs; how to file, and how to finance your business.

With the methods which have been successfully used by 149 executives, the book also contains 40 illustrations of charts and forms visualizing these methods.

This book can be obtained with an 18-months' subscription to "System," the magazine of business, at the price of "System" alone—$4.50.

JERUSALEM GETS ITS FIRST UNPOLLUTED DRINK IN CENTURIES

It is doubtful whether the population of any city within the zones of war has profited so much at the hands of the conqueror as that of Jerusalem. In a little more than half a year a wondrous change has been effected in the condition of the people.

One of the biggest blots upon the Turkish government of the city was the total failure to provide an adequate

WINNIPEG PLUMBING DIVISION

Permits Issued

103

Inspections

Water Tests	Smoke Tests	Subsequent Inspections	Miscellaneous Inspections	Defects Rectified
69	88	302	22	157

Sewer Division

Permits issued	Connections constructed	Inspections
15	13	47

Sewer Maintenance Division

Tank Flushings Gallons	Hose Flushings Gallons	Total Gallons of Water
920,576	714,375	1,634,951

water supply. What they could not or would not do in their rule of four hundred years His Majesty's Royal Engineers accomplished in a little more than two months.

The picturesque water carrier is passing into the limbo of forgotten things. The germs that infested his leathern water bags will no longer endanger the lives of the citizens, and the deadly perils which lurk in cistern water have been to a large extent removed.

Depended on Rainwater

For its water Jerusalem used to rely mainly upon the winter rainfall to fill its cisterns. Practically every house has its underground reservoir. But many had fallen into disrepair, and most of them required thorough cleaning. To supplement the cistern supply the Mosque of Omar reservoir halved with Bethlehem the water which flowed from near Solomon's pool down an aqueduct constructed by Roman engineers under Herod before the Saviour was born.

This is not nearly sufficient, nor was it so constant a supply as that provided by our army engineers. They went farther afield. They found a group of springheads in an absolutely clean gathering ground on the hills yielding some 14,000 gallons an hour, and this water, which was running to waste, is lifted to the top of the hill, from which it flows by gravity through a long pipe line into Jerusalem.

Supplies run direct to the hospitals, and at standpipes all over the city the inhabitants take as much as they desire. The water consumption of the people has become ten times what it was last year.

The scheme does not stop at putting up standpipes for those who will fetch the water. The water level of the cisterns is low, and as they are getting emptied the authorities arrange for refilling them on the one condition that they are first thoroughly cleaned out and put in order.

A householder has merely to apply to the military governor for water and a sanitary officer inspects the cistern, orders it to be cleansed, and sees that it is done, and the Department of Public Health grants a certificate that the cistern is clean, and the engineers run a pipe to it and it is filled, no matter what its capacity may be. Two cisterns were recently replenished with between 60,000 and 70,000 gallons of water from the hills.

The installation of the supply was a triumph for the Royal Engineers. A preliminary investigation and survey of the ground was made on February 14, and a scheme was submitted four days later. Owing to the shortage of transport and abnormally bad weather, work could not be commenced till April 12. Many miles of pipe line had to be laid and a powerful pumping plant erected, but water was being delivered to the people of Jerusalem on June 18. There has not been a stoppage or a hitch.

A medical authority says the health of the community is wonderfully good, and there is no suspicion of cholera, outbreaks of which were frequent under the Turkish regime. Government hospitals are established in all large centers, and frequent medical treatment is given to the indigent. Many thousands of natives in the last few months have come forward of their own free will to be vaccinated.

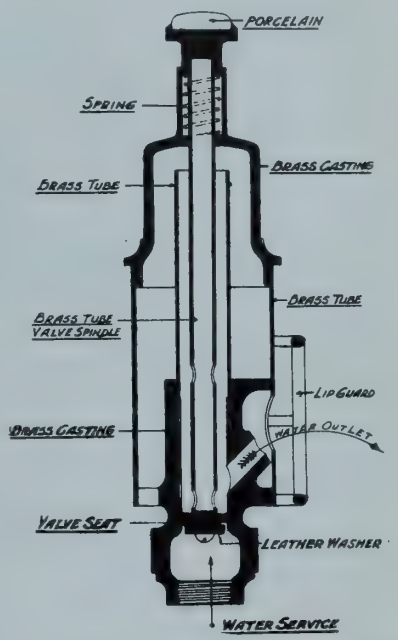
Typhus and relapsing fever, both lice born diseases, used to claim many victims, but the figures are falling rapidly, due largely, no doubt, to the full use to which disinfecting plants are put in all areas in occupied territory.

In Jerusalem an infants' welfare bureau has been instituted, where mothers are seen before and after childbirth, infants' clinics are being established, a body of health visitors is in process of formation, and a kitchen is about to be opened to provide food for babies and the poor. The nurses are mainly local subjects, who have to undergo a thorough training, and there is no one here who does not confidently predict a rapid fall in the infant mortality rate.

The spade work was all done by the medical staff of the occupied enemy territory administration. Some voluntary societies are now assisting, and the enthusiasm of the American Red Cross units, which have recently arrived with an admirable equipment, will enable all to carry on a great and beneficent work.

NEW SANITARY DRINKING FOUNTAIN

One of the latest inventions of note in connection with the sanitary engineering profession, is that of a new sanitary drinking fountain. This is the one which is referred to in an article



East, sanitary drinking fountain adopted by Winnipeg Board of Health.

on the subject of Sanitary Drinking fountains.

The inventor is Robert Jas. East of Winnipeg, and it is being manufactured by the James Robertson Co., Toronto, Montreal and Winnipeg.

They Tied a Can on Him

HE learned his trade long years ago inside a little shop, he graduated with a whirl, a skip, likewise a hop. He was a dandy in his day, he learned things powerful quick, they 'lowed he'd slide along in haste and show them all a trick.

He knew about a lathe, he did, this whistlin' chap called Bill, he knew about a planer and he knew about a drill.

He learned the good old ways, he did, of doin' this thing and that, and stowed his knowledge in his dome way up beneath his hat—and he reckoned that the way he knew was quite the best on earth, and things he didn't know or do had neither good nor worth.

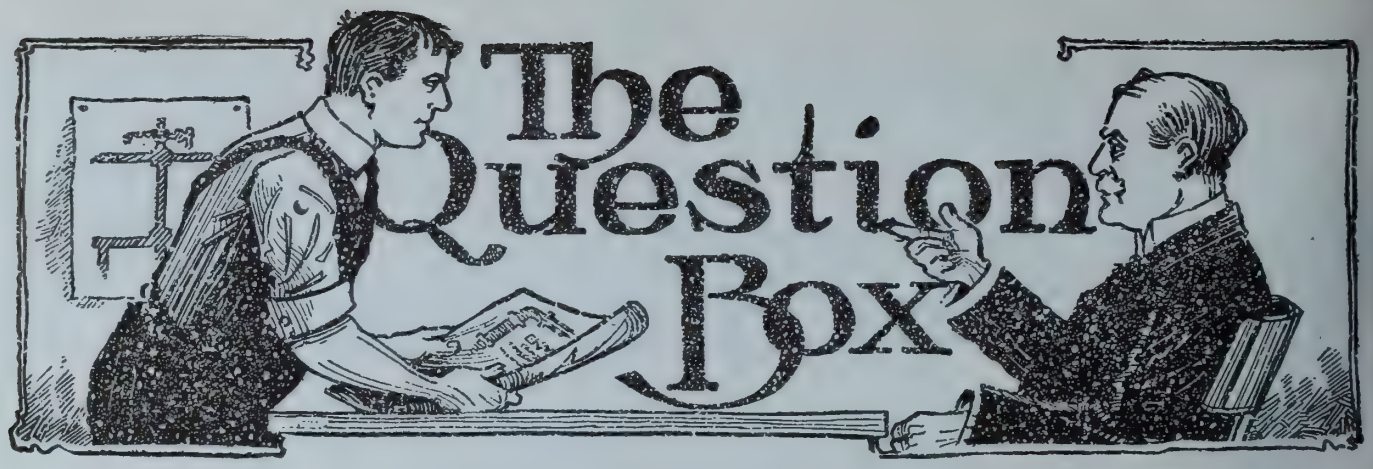
And so he went into the world to earn his daily bread, by sellin' out to other folks the stuff within his head.

But he didn't stop to grab no more, he didn't seem to think that stuff he learned long years ago might soon be on the blink. He hee-hawed at the chaps who worked and read books in the night, that they might keep their notions straight and know what things was right.

He had a snort for every kink that brighter minds had made, he wouldn't budge from what he learned in pickin' up his trade.

And other chaps went past this jay, they had the quickest way, and they'd do in just an hour or two what he'd fuss at all day. And yet he wouldn't take the choke and get himself in shape, he was just standin' still, by heck, this wise and knowin' jake.

This thing went on for years it did, he wouldn't budge an inch, he wasn't wise enough to see the comin' of the pinch. The firm he worked for watched this jay, he'd neither go nor vim, so they came along one day, they did, and tied a can on him.—Ark.



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published--Description of Jobs Done or Shop Kinks Are Also Invited.

WHAT CAUSES THE TROUBLE?

Editor Sanitary Engineer: Could you give me any information regarding the following hot water supply job? About a year ago I was called in to a house to find out the reason of lack of hot water. I found that the plumber had neglected to insert a tube down into the 60-gallon range boiler. I put one in and everything was O.K. as far as furnishing hot water was concerned. Just recently, however, I was called in again; the trouble this time was that of a supply of dirty water in the guests' bathroom (see sketch enclosed), and apparently no matter how long water is run, it is dirty.

Do you think the return pipe going to the cellar and up to the stove will work? Will the water not flow to the bath in both directions?

Will the dirt not come up from the stove?

Do you think that when any other tap is opened that it will take away the pressure in the guests' bath?

The trouble is dirty water in the guests' bathroom only, the others are O.K.; it is a soft water job.

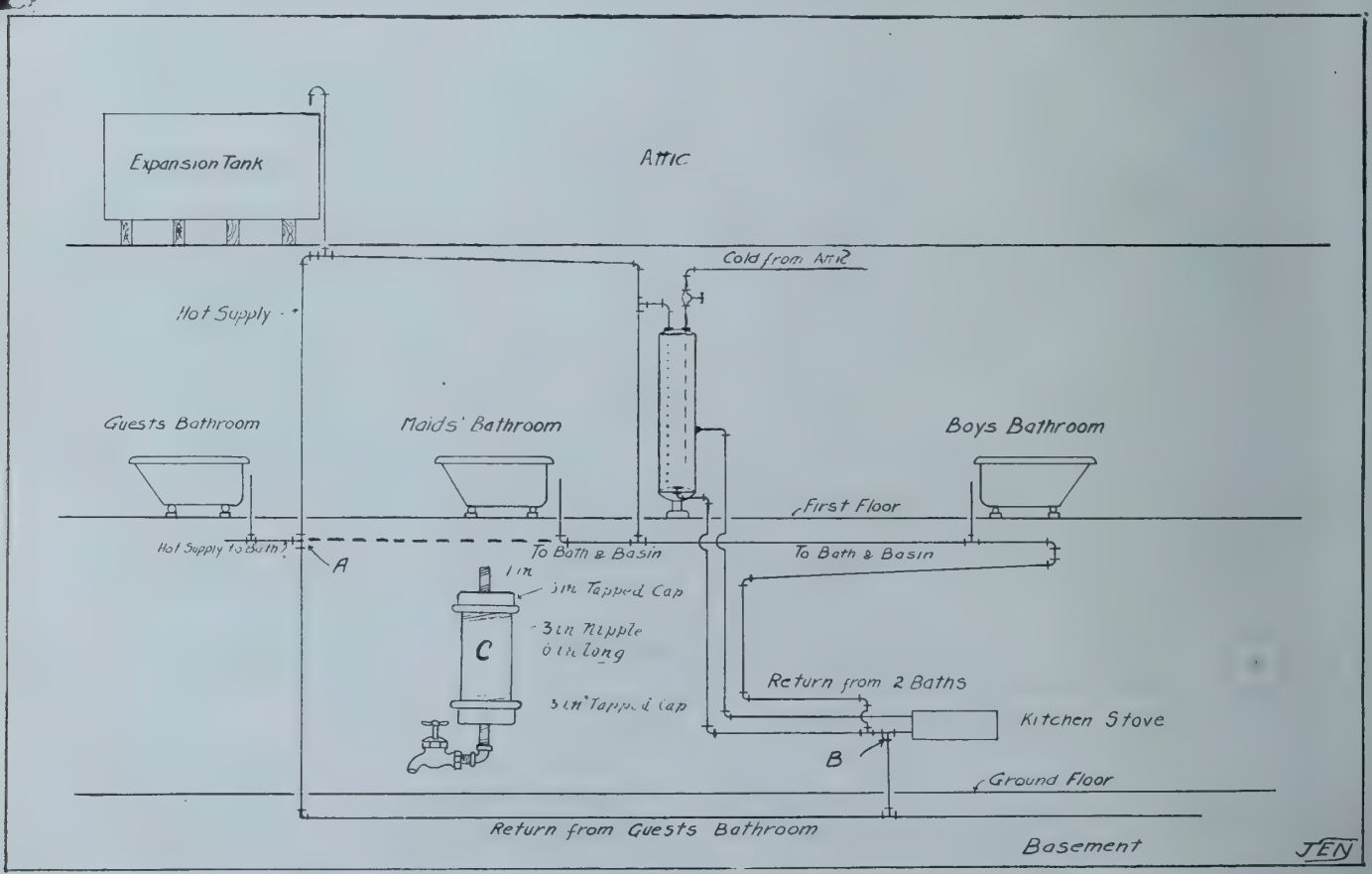
R. McA. H., Ontario.

The accompanying sketch in solid lines shows the way the piping is installed according to our enquirer.

We are of the opinion that the pipe shown running from the guests' bathroom down to the basement is the cause of all the trouble, unless of course the pipe is of black iron, which may account for some of the trouble. But it will be seen, however, that the pipe marked at A and B will hold all dirt or deposit from the rest of the piping.

We would suggest that the circulating pipe at A and B be taken out and a pipe installed as shown by the thick dotted lines, then make a dirt pot by using a nipple, two caps tapped and a small nipple screwed into the tee shown at B. See small sketch inserted as shown at C.

There is another precaution that should be taken, and that is some provision made to keep any undue amount of sediment getting into the pipes from the attic tank.—Editor.



Sketch submitted by inquirer, the dotted lines are added to overcome the trouble provided that the pipe line from A to B in taken out.



MUELLER

Compression Sink Bibbs

SIMPLE elegance, combined with superior strength and wearing quality, is what you give your customer when you install MUELLER goods.

The many advantageous features of MUELLER compression bibbs give maximum service from the bibb as a whole. The anti-spreading device that breaks up the whirling motion of the water and the corrugated stem and handle, allowing the handle to be set at any angle without becoming loose or wobbly, are only two of these features.

MUELLER Bibbs are the best the market affords. Write for prices.

H. Mueller Mfg. Co., Limited

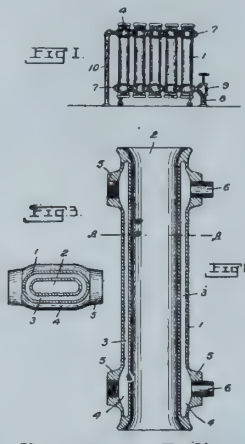
SARNIA CANADA

MUELLER

NEW CANADIAN PATENTS

Continued from page 23

having its upper surface above the top of said bowl, a recess extending from said bowl into said extension, said rim extending around the edge of said recess, a cover having a tongue extending into said recess, laterally extending lugs formed on the sides of said extension, and hinge connections for said cover attached to said ears.



No. 184,695. Radiator.

No. 184,695.

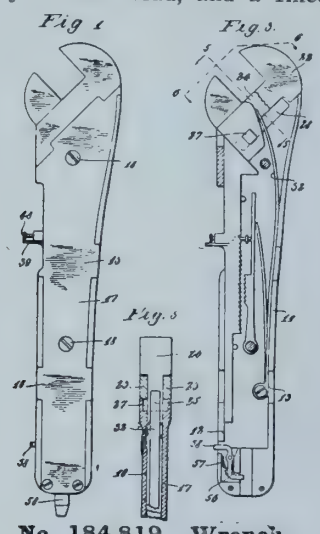
Charles Edouard Jeannotte, Montreal, Canada, 4th June, 1918; 6 years. Filed 6th April, 1918. Receipt No. 293,201.

Claim. A radiator section comprising a one-piece integral hollow member provided with a circumstantial water column, an annular enlarged portion adjacent each end of said water column and inlet and outlet openings provided in the sides of said hollow member, substantially as directed.

No. 184,819.

Leon Gniewc Zynski, Brooklyn, New York, U.S.A., 11th June, 1918; 6 years. Filed 15th January, 1918. Receipt No. 289,765.

Claim.—1. In a wrench of the class described, the combination with a hollow body, a handle affixed thereto, an integrally formed head, and a fixed jaw



No. 184,819. Wrench.

formed in said head, of a jaw slidable within said head, means for normally keeping said jaw in an open position, a bar slidably engaged with said handle, said bar having an angular head engageable with said movable jaw, a plurality of ratchet teeth formed on one side of said bar, a lever fulcrumed in said casing having teeth normally engaged with said ratchet teeth, means for advancing said bar toward said head, and means for depressing said lever whereby said teeth may be disengaged.

2. In a wrench, the combination with a hollow handle and a body, of a slotted head integrally formed therewith, a jaw formed with said slotted head, a spring adapted to press said movable jaw away from said head, a bar slidably engaged within said head and body, said bar having an end contactable with said movable jaw, a plurality of ratchet teeth formed with the inner side of said slidable bar, a lever fulcrumed in said casing, said lever having a plurality of teeth engageable with the ratchet teeth upon said slidable bar, means for maintaining said lever and bar in relative position, a spring adapted to move said lever teeth into engagement with the teeth on said bar, means for moving said bar towards said movable jaw, and means for releasing said lever teeth from the ratchet teeth on said bar.

3. In a wrench, the combination with a hollow casing and a cover therefor, of a head formed at one end of said casing, said head having a longitudinal slot, a fixed jaw formed with said head, a movable jaw operable within the slot in said head, means for engaging said movable jaw therein, a ratchet bar movable longitudinally within said casing, a head formed therewith adapted to engage with said movable jaw, means for operating said sliding bar, means for holding said sliding bar in operative position, means for engaging said sliding bar in an adjusted position, and means for disengaging said engaging means.

JAPAN'S EXPANSION

Enameled hardware, which was imported into Japan before the war, was exported in 1917 to the value of 3,000,000 yen ($150,000). The export of sulphuric acid increased from 3,000,000 lb. to 10,000,000 lb. whilst the value of the porcelain and earthenware exports increased from 6,000,000 yen ($300,000) to 12,000,000 yen ($600,000).

CREATE NEW BUSINESS

Continued from page 27

June 1st issue of SANITARY ENGINEER creating sixty-seven thousand dollars' worth of business. Such a report proves that business actually created never fails to be worth while. Away back in the year 1914 SANITARY ENGINEER preached and is still preaching that the farmer and the rural resident is the best prospect for new business, with a close second in repair and reconstruction work in cities and towns. Sanitary engineers are prone to talk high prices, such in essence are not so. When sanitary fixtures were at a lower price, no one was making money. Very few manufacturers could show any interest for capital invested. The jobber was the only individual that was making money and he was really the cashier both coming and going. He bought for almost cash from the manufacturer and sold on credit to the trade, and had to protect himself, and rightly so. But all this proved that sanitary fixtures were always too low in price if value in service of same, etc., can be taken on a par with commodities in other lines.

Therefore the sanitary and heating engineer must settle down and take for granted that present prices are not likely to drop very much if he and the manufacturer is to have a fair profit. Many a person delayed certain work two years ago because of high prices; to-day the cost of that work is greater. Repairs are now almost out of the question, having been so neglected, waiting for lower prices, that now it is a case of tearing all out and replacing, whereas had repairs been made two years ago, the need for the present repairs would not have happened.

And so it goes all along the line. There is no just reason why every sanitary and heating engineer should not dig right in and keep what men he has good and busy either looking up new work, encouraging owners to make certain repairs and thus create new business now, and create at the same time a better impression in mind of the public at large, of the trade as a whole always remembering that the bread of honest toil is ever sweeter than charity.

WILLIAMS' "VULCAN"
Drop Forged
Chain Pipe Vise



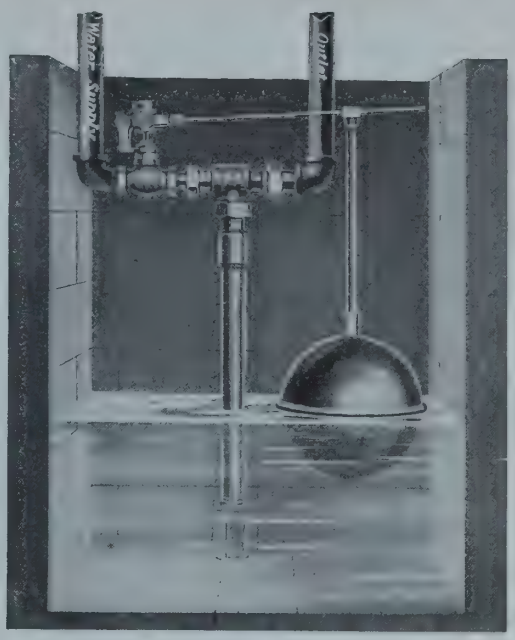
3 Sizes---
⅛ to 8" Pipe

UNBREAKABLE
Grip Powerful Readily Adjusted
Individual Capacity Large
Attachable Anywhere
Guaranteed Absolutely
Booklet Free

J. H. WILLIAMS & CO.
"The Drop Forging People"
77 Richards St., Brooklyn, N.Y.
77 S. Clinton St., Chicago, Ill.

The A. G. Low Company, Limited,
77 Pacific Ave., Saskatoon, Sask.
Agents for Manitoba, Saskatchewan,
Alberta and British Columbia

The Morrison Cellar Drainer Operates by Water Pressure



For ease of operation and simplicity of construction this cellar drainer has no equal on this continent. It can be installed easily, and takes up very little space. No complicated cams or levers to get out of order. And all working parts are placed above water.

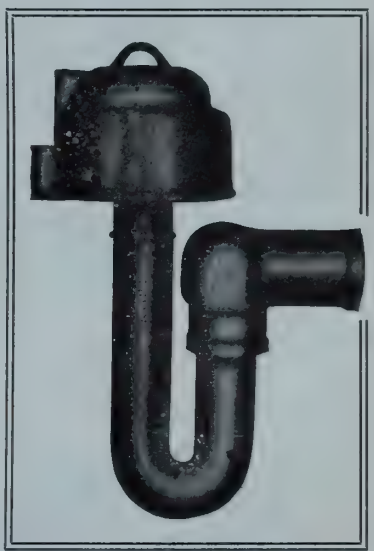
Everyone knows the reputation that stands behind Morrison Products.

Let us furnish you with full particulars and prices when in need of an apparatus for this service.

The James Morrison Brass Mfg. Company, Limited

93-97 Adelaide Street West, TORONTO, ONTARIO

A Syphon Is The Heart Of a Sanitary Septic Tank— *Anthes Syphons Are Faultless!*



Regular and intermittent discharge in connection with the sewage system is absolutely necessary or the system installed is a failure.

Anthes Syphons and Soil pipes have no superior for permanence, quality and price.

Anthes Syphons are unconditionally guaranteed. We manufacture a full line of cast iron pipe fittings at both our plants.

Ask your jobber for "Anthes" Syphons, soil pipe and fittings.

ANTHES FOUNDRY, LIMITED

TORONTO and WINNIPEG

First Cost *versus* Upkeep Cost!

The purchase price means nothing if the upkeep cost is not low.

The purchase price of King Boilers is no more than the average boiler and yet—

The consumption of fuel—*the upkeep cost* is lower—considerably lower.



The thin, peculiarly shaped waterways in the "King" mean quickly heated water and perfect circulation, which causes a saving in fuel because it obviates the necessity of "extra firing" to move cold water from the radiators.

The Trade should use this quick-heating, fuel-saving argument now while fuel is scarce and high in price.

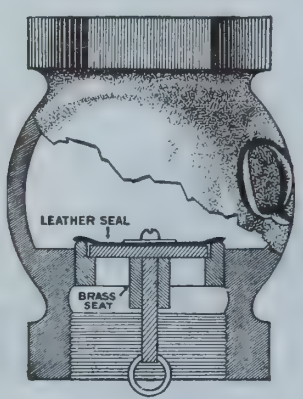
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Steel and Radiation, Limited

Head Office, FRASER AVENUE, TORONTO

304 University Street, MONTREAL **101 St. John Street, QUEBEC**

AGENCIES IN ALL LEADING CITIES



This is a "Q" Foot Valve

And it Just CAN'T Leak

There are more pump troubles caused by "leaky" valves than from all the wear and tear which occurs in the average life of a pump.

The "Q" valve will overcome all priming troubles, and water once raised above it, through the suction line, will not leak out.

If you want the pumps you instal to give maximum, you will require to use the only valve on the market that JUST CAN'T LEAK.

Made in sizes from 1 to 8-inch.

R. MACDOUGALL CO., LTD.

GALT **CANADA**



M. & T. COILS EXTENDED SURFACE

Our Coils are not simply cored castings, but are specially designed to heat water with less effort and using less fuel. The extended surfaces and special tappings make the M and T Coils **the most efficient** on the market.

McIntyre & Taylor Limited

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How 24,000 Fitters Added $1,000 to Their Profits Last Year!

IF you want to find out where a fitter stands—whether he is making money—ask him what he knows about the newest things in the business.

Ask him if he is using the latest heating systems and devices. Ask him if he is using up-to-date boilers—the best **valves, pipes** and **fittings?**

Ask him if he is using "X" Boiler Liquid!

If he is a shrewd, thinking fitter, he'll tell you he doesn't dismantle and weld leaky or cracked boilers any longer. He has found out how to give his customers a better job—and make more money for himself.

In fact, last year over 24,000 fitters used "X" Boiler Liquid—and almost every one added about $1,000 in additional profit to his income.

"X" Liquid is simply poured into the boiler. In 30 minutes it will repair every leak or crack—and make the boiler as good as new. No time is lost. No tools need be carted. No hanging around on the job.

With "X" Boiler Liquid you know in advance the time the job will take. So you make a flat price—get a definite profit—and save a lot of argument with a cranky customer.

Many enthusiastic fitters tell us that they consider "X" Boiler Liquid the greatest step forward that the business has seen in ten years!

And in addition to making a Scientific Repair "X" Liquid will prevent Rust, Scale and Foaming!

Jobbers in Canada handling "X" Boiler Liquid:

Crane Company	**Winnipeg, Manitoba**
The Dominion Radiator, Ltd.	**Winnipeg, Manitoba**
Sumner Company	**Moncton, New Brunswick**
J. T. Blyth	**Ottawa, Ontario**
Dominion Radiator Company	**Toronto, Ontario**
The Empire Mfg. Co.	**Toronto, Ontario**

"X" is not a cement or powder. It is a LIQUID. You should beware of dangerous imitations of "X" in solid or liquid form. These imitations clog the air valves. "X" Liquid is guaranteed not to be harmful—and will positively do all we claim or your money will be returned.

"X" LABORATORIES

366 Washington Street Boston, Mass.

Over 50,000 Daisy Hot Water Boilers Now In Use—Are *You* Selling Your Share?



Daisy Hot Water Boilers are easiest to sell because they have an established reputation for exactly meeting the requirements of the modern home.

Every Daisy you instal will help build bigger business by bringing repeat orders for installation in neighboring homes later.

AND DON'T FORGET

Buy lots of **VICTORY BONDS.** It's your bounden duty to stand back of our boys.

WARDEN KING Limited, Montreal

BRANCH OFFICE: 136 SIMCOE ST., TORONTO

WROUGHT PIPE

BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES Black and Galvanized All Sizes

Ask your jobber for CT Brand

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Montreal Works: Lachine, Can.

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The time to put on fire insurance is before the fire. The time to prepare for after-the-war conditions is before peace comes.

Advertise now and be prepared to keep your goods in demand through the medium of SANITARY ENGINEER

The Wrench of 25% Greater Efficiency

TRIMO PIPE WRENCH



Two new features have been recently added to the Trimo Pipe Wrench, namely Nut-Guards, in all sizes, and unbreakable steel frames, in leading sizes.

The Nut-Guards prevent the accidental rotation of the nut while in use.

These improvements add 25% to the usefulness of the tool.

The Trimo Pipe Wrench is made with wood handles in 4 sizes, 6-in., 8-in., 10-in., 14-in. and in steel handles in all sizes, 6-in. to 48-in. inclusive.

All Trimo Pipe Wrench parts are interchangeable.

The inserted jaw in the handle can be readily replaced when worn, thus adding to the life of the tool.





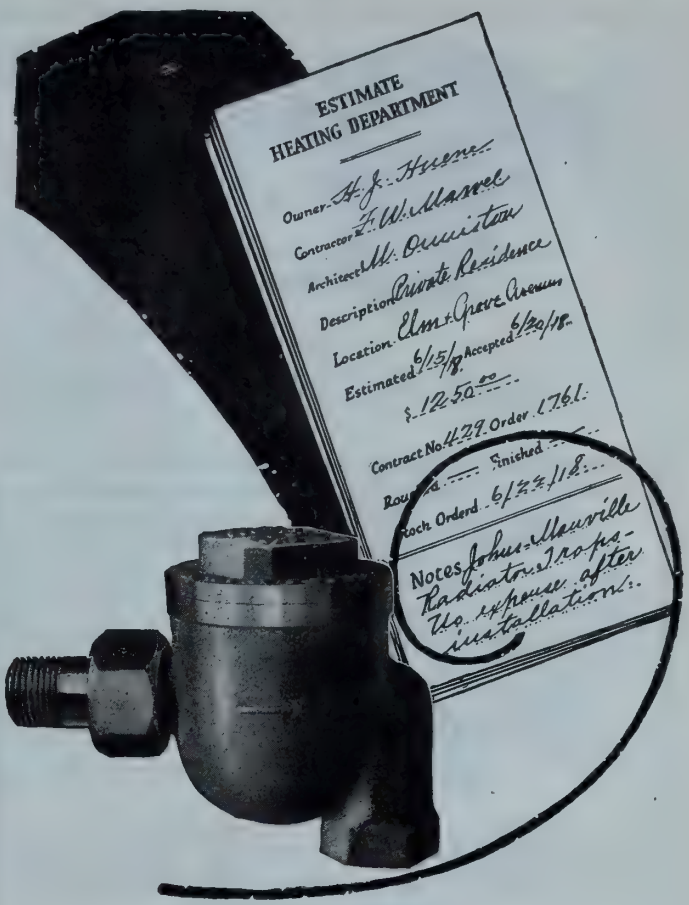
Nut with Nut-Guards

Inquiries from Importers and Dealers Solicited. Send for Catalogue No. 55.

TRIMONT MANUFACTURING CO.

Cable Address: Triwrench
Code: Western Union

Roxbury (Boston) Mass., U.S.A



Your Next Heating Estimate

In making up your next heating bid, enter this item—"Johns-Manville Radiator Traps"—and in your cost column, right opposite, enter "Lower Cost"—then add this note—*"No expense after installation."*

Before this better and most simple Radiator Trap was made, *finishing-up* details took too long. That meant real money loss. Profit dwindled as troubles increased. But now—with this three-piece trap—only a body, cap and hollow ball, when you finish a job—you're done. Because it cannot leak, or bind, on either air or steam. And it is fool-proof and armor-plated against meddling fingers. Self-adjustable, it is mechanically perfect in design as well as in action.

There are two profits coming to you—one on the selling price, and one on installation. Our nearest branch will mail you a copy of our Steam Trap bulletin if you request it.

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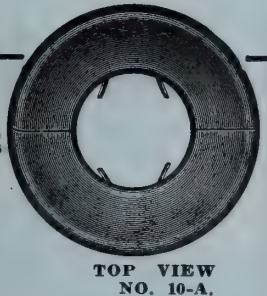
THE CANADIAN
H. W. JOHNS-MANVILLE CO., LTD.
Montreal, Toronto, Vancouver, Winnipeg, Hamilton, London, Ottawa.

Johns-Manville Radiator Trap



OPEN VIEW NO. 10-A.

The CEILING PLATE that's better



TOP VIEW NO. 10-A.

THE NO. 10—A NARROW FLANGE PLATE IS A STEEL HINGED PLATE. FLANGES ¾" WIDE. HIGHLY FINISHED. ESPECIALLY DESIGNED FOR TWIN CONNECTION "NARROW."

The split ceiling plate is coming more and more into use than ever and ALWAYS GIVES A NICE FINISH, because it can be attached to mains and risers at the very last, and is not exposed during completion of a building on the floors.

High quality at the right price.



Gem No. 4.

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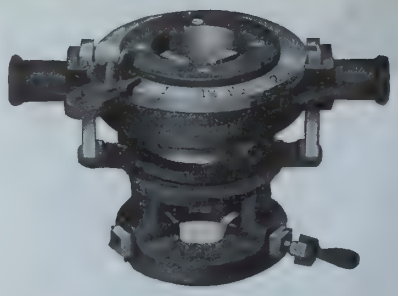
Made from the best brass obtainable. Pressed shell and pressed brass base which eliminate danger from blowholes, which is a fault with cast bases.

Write for catalog showing our complete line of specialties.

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PIPE THREADING AND CUTTING TOOLS

One Man Can Thread up to 12 Inch.

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No. 1 cuts from ⅛" to 1"
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Ratchet	Geared
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The Borden-Canadian Company

TORONTO, CANADA

"JUST ONE MINUTE"

To call your attention to the Famous B & C Floor and Ceiling Plates.
Our No. 15 style narrow flange designed for the Canadian trade.

One of many styles



No. 15

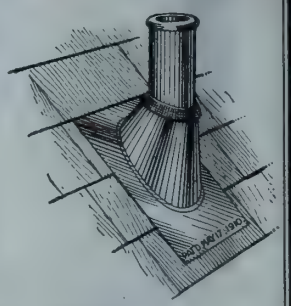
Handsomely nickel-plated or plain Sizes ½ to 2"

Stock now carried by our Canadian Representative
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The SIMPLEX Adjustable Roof Flange

Fits any roof from ½ pitch to flat—just slide it down the pipe and it will conform with the pitch of the roof.



Trade Price 2" $1.00 4" $1.15

Made in all sizes—For sale by nearly every jobber

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1-2" to 4"

Black and Galvanized

Send us list of your requirements

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Works: LACHINE, QUE.

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For steam, water, air, oil, gas, gaskets, etc. The cement that cements. Sets like gum. Allows no leaks.

The Great Value of "HAUSE PIPE JOINT CEMENT" lies in its peculiar chemical properties which permits of its hardening and expanding after the joints are made up. In making up joints it has the same effect as a lubricant on the best graphite, and while the joints may be made and broken readily, a perfectly tight joint is maintained at all times. Comes in 1-lb., 5-lb., 15-lb., 25-lb., 50-lb. cans, 100-lb. barrels. Manufactured in ready mixed and powder form. Ask your jobber for prices, or write us direct.



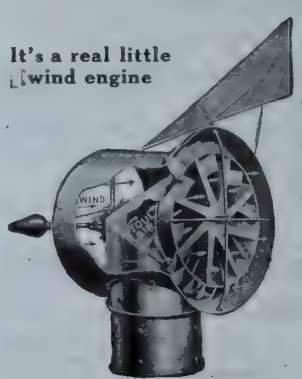
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Chas. F. Hause Mfg. Co., Inc., Omaha, Neb.
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It's a real little wind engine



Is a positive suction fan that ventilates

The "Bicalky" will dispense with all auxiliary heaters on local ventilation systems.

It is, as far as we know, the most scientifically constructed, self-propelled fan ventilator on the market.

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THE SECRET OF THE DART'S PERMANENCE lies in the facts (1st), that both faces of the joint are BRONZE (a non-deteriorating metal); (2nd), that the HEAVY IRON PARTS will not stretch or pull apart; and (3rd), that they are made in a factory whose only product is Dart Unions.

Pipe coupling trouble and their upkeep expense do not exist where Dart Unions are used.



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TORONTO, CANADA

There Are Lots of Gate Valves

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but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.
Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.
Approved by the Fire Underwriters' Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario

THE COUNTRY NEEDS COPPER

WHY WASTE IT IN W.C. TANKS?

A TANK WITHOUT A LINING



A TANK WITHOUT A FAULT

EVERY FITTING TESTED

EVERY TANK GUARANTEED

OVER A QUARTER OF A MILLION NOW IN USE

And not a complaint to our knowledge. That is because we operate a plant that is equipped to make Vitro Tanks exclusively.

No joints of any description—an all one-piece tank—the tank with the trouble left out. That's why it is called the NO-TROUBLE Tank.

Galt Brass Company, Ltd.

Galt, Canada

SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

Vol. XII. Publication Office, Toronto, December 1st, 1918 No. 23



EMPIRE RADIATOR VALVES

When installing that job of hot water or steam radiation, think of the reputation for good value, service and quality that stands behind Empire Valves.

As an added inducement, think of delivery. Are you always sure just how soon you can have deliveries made. You **can** be, if the E. M. Co. is handling your order! Our deliveries are good.

That's what we mean when we say **Empire** stands for **Efficiency** and **Service.**

"The only come back is for more."

We can make deliveries from stock, and we operate the largest exclusive plumbers' brass plant under the British Flag. It is at your service, too. One thing more — when you buy radiator valves or any other line of brass goods, look for the Empire.

Are Made Just Right

Empire Manufacturing Co., Limited

LONDON TORONTO

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While



A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for BEAVER BRAND CAST IRON ENAMEL WARE

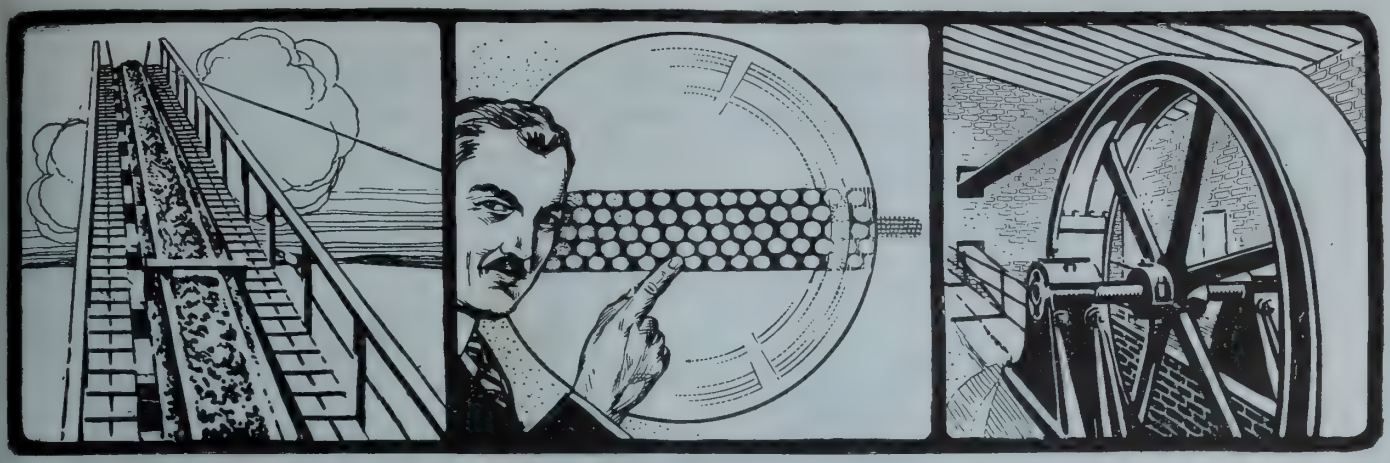
Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

ONTARIO:
Monarch Brass Mfg. Co., 71 Brown St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes, 120 Lombard St., Winnipeg



Dominion Rubber System Belting Insures Maximum Service

Dominion Rubber System Belts are built to a scientific quality standard which insures the proper width, thickness and type of construction to efficiently serve a given purpose.

Dominion Rubber Systems Belts are *one-piece belts*—with absolute uniformity, dependability, economy and satisfaction built into each foot.

The layers of strong endless fabric are saturated and embedded in special rubber which gives a toughness that is practically indestructible.

Its rubber surfacing has a tested pulley grip greater than that of any other belt made, hence it allows minimum power leakage.

Where water, acids, oils, dust, grit, belt-shifters, etc., soon ruin ordinary belting, there is a type of Dominion Rubber System Belting that will withstand the severest punishment and eliminate many replacements and delays.

The largest users of belting in Canada have proved the value and efficiency of our belting in actual service and through the special free service of our belting experts, have cut costs and speeded up production.

This free technical service is yours to command whether you are a customer or not and it opens the door to the entire facilities of the largest rubber organization in Canada with a fifty year record for producing dependable products.

If your belting problems need emergency service, phone or wire our nearest branch.

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Dominion Tires, the Good Tires for every purpose.

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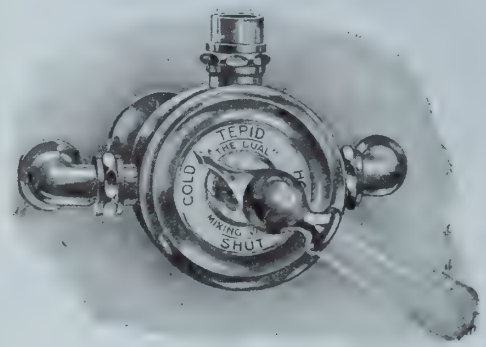
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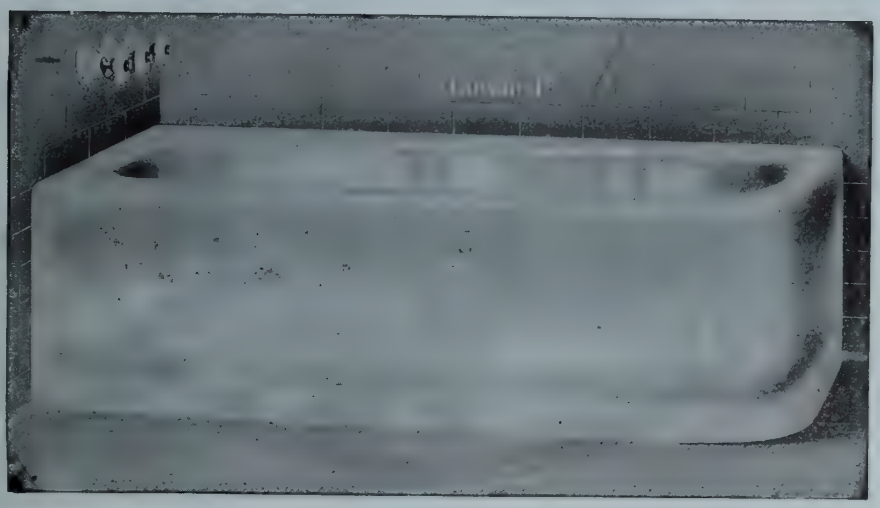
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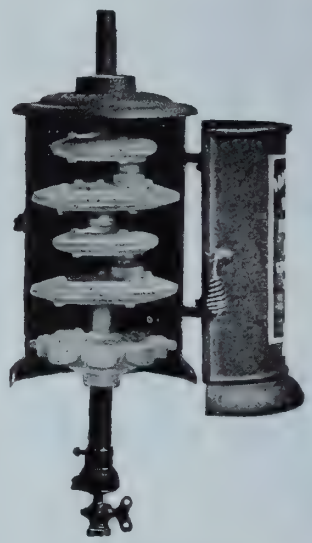
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Why Jenkins Bros'. Valves are Superior



Fig 106

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Fig. 108

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Fig. 114



Fig. 124

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—Edward N. Hurley, formerly Chairman of the Federal Trade Commission, in "The Awakening of Business."

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SANITARY ENGINEER

VOL. XII. DECEMBER 2, 1918 No. 23

Saving the Oil

A Little Shop Talk—What Oil is For—How It Should Be Used—Different Kinds of Oil for Different Purposes—Like Money It Exists to Be Used and Not Wasted

By One Of Us

I CAN almost see the reader picture in his mind a story about oil, after reading the above heading. Well, it is and it isn't. There are so many kinds of oil and greases. For example, elbow grease, and the kind of oil or grease, or whatever you may call it, which I am going to write about, is that kind which helps the world go round easier. At the same time, I must refer to cutting oil—oil used for lubricating purposes. Oil used as a binder, and oils that heal both body, soul and spirit.

I remember quite well a boss I once worked for getting real mad at me for using too much oil. He fought and fumed like Sam Hill and said I used too much oil, and so on. Well, I'm only human and I felt like firing that boss, but I didn't. No, I just went on using oil, but mind you, I did not waste it by any means. Saving where real saving can be effected has always been a pet hobby of mine. However, I got even with that boss, when a few days later he told me to go up to another job and fix some leaks. It was a hot water job, and nearly every thread leaked.

So up I went. The boss told me there was a full kit of tools on the job, so I began to look over some of those leaks. The first I tackled required to be taken out and a new piece of pipe cut, because of the fact that the thread was a poor one, and I don't believe in botching a joint with yarn or other dope; pipe compounds are all right and should be used on good threads, but poor threads are no good on any job.

The fun began when I started to put a thread on the new piece of pipe. By the Lord Harry, that die seemed to stick to that pipe closer than a brother. Oil says I, oil, but no, the oil can was empty. Next I gave the dies a good look over and saw where more trouble came in. The chasers were as dull as a hoe. So off I hiked to my other job, got my own tools *and some oil.*

While I was away the boss called at the job where the leaks were, to see how I was getting on, asked me where I'd been and so on, spotted the oil can which I was carrying in one hand and sneeringly referred to the oil can. Says he, Jim, by——— you use more oil than the whole gang. I up at once and replied, Yes and by——— I have less leaks. Just look at those dies, pointing to the ones standing at the bench, and take a look at mine. Then cast your weather eye on that thread I've cut off which caused the leak. That was enough, but like all fellows or nearly all, instead of letting the lesson sink in, I began to "sass" the boss. He stood there while I "sassed," and as a parting shot I said, that from then on I'd buy my own oil but of course I didn't. That job cost the boss over $70, to fit leaks. And about a month after the boss told me quietly that the whole year's oil bill only amounted to about $50 and that he had had the bookkeeper go over the cost of the different jobs executed during a period of one year. The results proved that it had cost for fixing leaks, over $400. That was chiefly on account of saving that kind of oil that's used from a can.

Another Kind of Oil

I remember a story where an Irishman is said to have become horrified at the high cost of feed which he gave to his donkey. Said he to Neddy one morning, "Be jabbers, Neddy, I'll have to cut down on oats, the price is going up and there's nothing else for it." Well, Neddy never said a word, and Pat thought he'd put one over on his donkey, but a few mornings later Neddy had sent in his resignation and gone to the happy hunting grounds of all flesh.

More Oil, Less Friction

Some bosses are like butchers, they live by their losses. You ask a butcher how he makes a profit in his business and he'll tell you (perhaps) that he profits on the bones, fat and bits he cuts off after he's weighed your meat. Have you never noticed a butcher almost always asks you if you "want the bones taken out," and as sure as eggs are eggs if you say no, he charges you a higher price per pound, he gets no bones back? That joke is nearly as bad as the joke about "going back to the shop for more tools."

But to come back to that kind of a boss who kicks about saving oil and who is always grouching about losing money on every job. He's trying to save oil, but is not content with that—he goes and throws sand in the bearings.

What happens? The fellow doing the job gets sore and begins to wonder how the mischief it is that the boss loses money on every job, yet lives in a better house, rides home in a tin Lizzie, takes a week or so off in the summer fishing and a couple of weeks hunting in the fall. There's where the I.W.W. gets in, and rotten socialism. That boss isn't saving oil, he's using poor oil, and mixing it with gun-powder. There is need of a different kind of oil, and more of it, and a kind of oil which helps elbow grease to work out at the joints of every employee. Make every job as easy as possible by a kind word or two linked up with a ride home in your tin Lizzie once in a while. See that every man has a good kit of tools and give him time to keep them clean and in good order. Plan a week off at least for every man and pay his wages; remember that his home cares are yours. That's the kind of oil that creates true socialism, the true brotherhood of man.

A Few Examples of Good Oil

I know one big concern, the founder of it is now dead, yet lives in over 5,000 homes because he loved them every one and knew them by name. He started with scarcely a cent but died a millionaire, he paid a bonus to every worker, and increased the bonus as time went on. Today the bonus alone amounts to nearly one million dollars a year. He is loved by every worker, is that dead boss. I talked with one of the "old boys" a while ago and to hear the way that old young fellow, young in memories, talked about that dead yet living boss, just proved that the oil was good. It's a pity there isn't more oil like that used these days. I know another fellow, he's a plumber too, and is pretty well off, but he uses good oil, his men are the best in the city in which they live, and they are furnished with good tools. This boss knows the age of every one of his men's kiddies. He knows their birthday and he also knows Santa Claus. He knows too that all

work and no play makes Jack a dull boy. Santa Claus sends a present to every kiddie of his men and every man gets a holiday with pay. That's good oil, and such oil is never wasted, tools never pull hard, consequently there is more work done in a day than would otherwise be done, particularly if the oil were poor and the boss was always yelling into the ears of his men, "Save oil, save oil."

Still Another Kind of Oil

Yet, there is still another kind of oil which should be used, and that is the oil of cheerfulness in our labors. I have known many a man, like many a machine, that no matter how good the oil was and no matter how much oil was used, neither the man nor the machine would run smoothly. The only thing to do with such men or machines is to either educate the former or re-model the latter.

That's the oil of co-operation. There never was a machine made that did not contain good metal. And the man is unborn that has not more good points in him than bad ones. He may have been spoiled because of the lack of good oil, or he may not have been given the proper training. Now, if the latter be the case, get right down to hard pan and find out all the good points. And use up these good points to the best advantage. For example, I knew one plumber who, when learning his trade, was never shown how to wipe a good joint; he never got so proficient as to make himself proud of any joint he ever wiped. But say, he could cut a soil pipe and run up a stack, measure off location of fittings and, make the best caulked joints I ever saw. He could do more—he could do the finishing touches, and fit up all the fixtures as no other man I ever saw. But as sure as fate the boss would expect that fellow to make as much progress on joint wiping as he did on the other part of the job.

That was not the best way to handle a man, so there was a need of more oil, the oil of co-operation and forbearance. On the other hand, no boss is doing justice to his employees if they are allowed to waste time. There are no benefits derived therefrom for any one, and such men as will persist in loafing can be handled in a diplomatic manner—a little fellow feeling, and a few words of explanation will work wonders. Try that kind of oil next time the die pulls hard, and if it doesn't work, scrap it, and get a new die.

The Truth About Coal Situation

A Little Advice That Can be Handed to Householders by the Trade—Soft Coal Can be Used in Square Sectional Boilers, Steam or Hot Water—No Hard and Fast Rules Can be Laid Down

THE great war is over, but the best and latest information at the time of "going to press" is that anthracite coal for domestic use is just as scarce as ever, and that there is no probability of it becoming any more plentiful during the coming winter.

There has been a great deal of conflicting and misleading information handed out by the daily press—as, for instance, on Saturday, Nov. 23rd, one of the dailies told the public that an emergency existed (which is correct) and hard coal was scarce, and in another column in the same paper it gave prominence to the idea that anthracite (or hard) coal would be plentiful. Similar see-saw information has at various times been given to the public.

The conditions prevailing in the Provinces of Ontario and Quebec also prevail in various States of the Union to the south of us.

A few weeks ago there was a survey made of the city of Baltimore, Md., and it was found there was then 22,000 homes without fuel.

Various cities and towns are clamoring for their supplies which are slow in materializing. Buffalo, we learn, has not as yet received one-half of their allotted supply.

Through the influence of the "flu" there was a drop in production of 1,000,000 tons during the month of October, and we are severely feeling the effect of this drop at the present time, as the receipts of domestic sizes of anthracite are merely nominal, and that with the worst weather conditions to face for the transportation for any further coming supplies.

What is the answer to all of this? Just one thing—use some substitute—suitable in so far as possible. It is not a question of very wide choice, but more a matter of what you can manage to get through with. Conservation of any supply in hand is imperative, and this with the substitution of other fuels will see us all happily through. The following two Bulletins issued by the Ontario Fuel Administration are well worthy of perusal by our readers and circulation to friends. The Bulletins are as follows:

Bulletins Nos. 2 and 3

It has been very much the same with information that has been published

Bulletin No. 2, issued by the Committee on Public Information, Ontario Fuel Administration

STUDY YOUR FURNACE

There is nothing mysterious about the modern heating plant. It is simply a fire enclosed so that the heat can be conducted to different parts of the building as wanted. The heat can be conducted because both hot air and hot water will rise if given the opportunity. Neither can travel downwards unless pressure is used, so that the necessity of a continuous upward flow is fundamental.

How to get more heat from your coal than the chimney does is now more important than any other branch of household economy.

In the average Ontario home 25 per cent. of the coal used can be saved by proper damper control. Under present careless, unscientific firing methods, it is estimated that only 25 per cent. of the heat value of the coal is utilized. Under proper conditions of installation and operation, 50 to 60, and even 75 per cent., may be converted into useful heat.

The flow of air through the fuel makes it burn. Try to visualize this flow of air, and you will easily learn how to operate the dampers properly.

The importance of personal attention cannot be too strongly impressed upon the householder. Study your furnace. Do not leave your heat problem to the itinerant odd-job man. Remember, every time you save 60 pounds of coal you have saved enough to make another 3-inch shell to be used against the Hun.

If you are not getting the proper heat, do not blame the coal, the furnace nor the fireman until you have actually determined which is at fault. It is natural to assume that most heaters are installed large enough for their work, provided they are properly fired. With the average heater the trouble is usually local.

The first essential is cleanliness. To get the most heat from the least amount of coal, the heater must be clean. One one-hundredth inch of soot has the same power to resist heat as 10 inches of iron.

The presence of dirt or ashes impedes the draft and interferes with the radiation of heat from the radiating surfaces of the furnace. These are in warm air furnaces the fire-pot and drum; in hot water boilers the sections through which the water circulates in order to take up the heat from the fire.

Above the feeder door (or to the side) are clean-out doors in the flues of the furnace or boiler. Keep these flues clean and remove the soot and fine ashes that lodge on the heating surface frequently. When doing this, have the draft door and coal door closed, and the check damper at the back also closed and the smoke pipe damper open.

Examine chimney, furnace and pipes; see that they are in good repair and clean; that fire, ashpit and clean-out doors are tight when closed: that smoke-pipe fits tight to furnace, and is not inserted too far into the chimney. Stop air-leaks into the furnace or fire-box. Trivial cracks may be cemented.

All heat pipes in the cellar should be thoroughly and completely wrapped with asbestos or other non-conducting material to prevent loss of heat. Your hot water or steam boiler should have a good covering of asbestos plaster or mineral wool.

There is not much use in trying to heat a building when. through ill-fitting windows or doors, a great part of the heat escapes or an undue proportion of cold enters. Storm doors and windows, weather strips and such preventative devices will lessen the amount of coal consumed. The place most likely to be neglected in this respect is the basement. A cold basement means a cold house, and seriously interferes with the heating apparatus. Cellar windows should be thoroughly gone over, and all unnecessary openings stopped.

from time to time in the daily and magazine press regarding means of handling substitute fuels for anthracite, as has been the published information regarding the fuel situation.

One paper published a column article on handling soft coal in furnaces, stoves, and heaters. This was clipped from a Chicago paper, and the coal that has been distributed to Chicago during the last couple of years, and which is the kind of coal that is referred to in the article, in question, is not the kind of soft coal we receive here in the Provinces, hence the information does not apply and is worse than no information.

A very widely distributed monthly magazine have in their December number a very well written article on the operation of fires with soft coal. The writer gives some good and valuable information and explains how he has reduced his fuel bill from $2 per day to $1.25 per day. He also explains how he pushes the live coals to the back of the grate, merely leaving the grate at the front covered with ashes and on this adding the new charge of fresh fuel. But boilers or furnaces where such would apply are only found in factories, office buildings, or palaces. The general public is still left to its own self.

Under present conditions nothing but soft (or bituminous) coal should be burned in square sectional boilers, firebox boilers or under tubular boilers, whether these be for steam or hot water, thus leaving the anthracite for the small users in stoves and ranges, and the smaller sized round hot-water boilers.

No specific directions can be given for firing soft coal as this will vary greatly with the kind and quality of soft coal, as also draft conditions. But here are a few simple observations:

(1) Soft coal ignites quicker than hard coal, so do not leave the draft on for as long a time as with hard coal.

(2) When coal is added to the fire always see that at least a little of the glowing coals of the fire is not completely covered.

(3) Don't fire the coal in too heavy charges at one time.

(4) Remember soft coal will need somewhat more frequent attention than hard coal.

(5) Leave the slide or wheel in the feed-door of the furnace open.

(6) Use the slice-bar or poker as much as possible in preference to shaking the grates too much.

(7) Don't shake or poke the fire oftener than may be required.

A little experimenting and observation of results will soon afford the means of obtaining excellent results with soft coal, and it will not be surprising to learn after the present conditions cease to exist that many who have become acquainted with the use of soft coal will continue to use this coal in preference to any other fuel.

Bulletin No. 3, issued by the Committee on Public Information, Ontario Fuel Administration

GENERAL RULES FOR ALL COAL HEATERS

The check-draft damper is as important in controlling the rate at which the fire burns as is the throttle of an engine in controlling its speed. Open it to check the fire; close it to make the fire burn more rapidly. Work it. Experiment with it in the daily regulation of your fire. It is located at the back, or on top, of the furnace.

Just enough draft, and that from below (through the lift or slide damper in the ash-pit door), is one of the best general rules. This checks the draft by letting more air into the smoke pipe and furnishes oxygen necessary for the consumption of gases—the more you open it and the more you keep it open the more the fire will burn.

A loose-fitting key or turn damper located in the smoke-pipe, between the furnace proper and the check-damper, will help hold the fire in many cases, particularly where there is a strong draft, partly closing in mild weather.

Never open the ash-pit door to make the fire burn more briskly; just raise the draft door or open the slide. The ash-pit door is intended to be opened only when taking out ashes. Opening the ash-pit door allows more air to enter than is necessary for combustion and this is wasteful. It also helps form clinkers in many cases.

Never open the coaling door to check the fire. If you cannot check the fire without opening the coaling door, you need proper dampers. Make use of the lift or slide damper in the coaling door only to let oxygen in to consume the gases.

Do not poke or slice a hard coal (anthracite) fire on the top. Disturb fire as little as possible.

When putting on coal or shaking the fire see that the check damper in the smoke pipe is closed.

If the fire is low, put on the draft by closing the check damper, opening the draft door at the bottom, and let the fire burn for a few minutes, then add a little fresh coal. When this is burning, and not before, the grates may be shaken.

Don't shake the grates too much. In moderate weather leave some ashes on top of grates; in severe weather shake until you see a glow in the ash-pit. The more and the oftener you shake the fire, the more it will burn.

Remove the ashes daily, and do not allow them to accumulate in the ash-pit; neglect of this interferes with the proper distribution of air, and will also cause the grates to warp or burn out.

The most economical results will be had from running a deep fire. Always have the firepot filled with coal to the bottom of the feeder door.

It is not economy to allow the house temperature to drop way down at night. It takes just twice as much coal to heat it up again next morning.

See that the grates work freely and are left in proper position (flat).

To leave fire for night, after burning off gases, partly close pipe-damper, close ash-pit damper, open check-damper.

In the morning if the fire has received fair attention the night before, 10 to 20 minutes should be plenty of time for leaving the draft door open, and the balance of the day, until fixing the fire for the night, there should rarely be need for opening again.

When burning soft coal have slide, or lift damper in firing door partly open. Soft coal requires air over the fire for proper consumption of gases.

These are general rules for operating your heating apparatus applying to all, but you should study the rules regarding the particular kind of heater you have—hot air, hot water or steam.

Mesopotamia Offers Trade Opportunities

British trade journals are calling attention to the great opportunities for trade with Mesopotamia after the war. It is predicted that it will become one of the world's great agricultural countries and that there will be an immense demand for manufactured goods.

In spite of war conditions this year's harvest is expected to be the greatest since the days of Nebuchadnezzar. The British are reported to have dug out more than one hundred canals formerly used for irrigation purposes in connection with the river Euphrates, but disused for many years. Some 320,000 acres have been brought afresh under cultivation—truly a wonderful achievement, doing great credit to the British local government.

The change that has come over the city of Bagdad since the British entered the town is reported to be simply marvellous. At that time the town was dead and moribund, while now it is full of life, building and construction work being carried on from early to late, with thousands of workmen repaving the streets and installing electric light and sanitation. A fire brigade and a police force have been organized.

SHEFFIELD EXPORTS

A steadily increasing weight of steel and tools is going to export markets, says a report from Sheffield, England.

The rolling mills report a consistent increase in work for the export markets consisting largely of mining and spring steel. Electric steel is still being neglected and some of the furnaces are standing. Many additional inquiries are coming in, however, from Colonial and foreign sources which should provide an outlet for some amount of electrically melted material in the near future. Deliveries of mild steel billets have become fairly regular and leave little cause for dissatisfaction.

The scarcity of malleable-iron castings is hampering the production of agricultural implements. No difficulty is being experienced in obtaining steel for this trade. It is believed that agriculture will be severely handicapped next year unless there is increased construction of implements during the winter months. Makers of steel parts for implements, and of spades, shovels and picks, are getting hopelessly in arrears with deliveries.

How I Developed My Business

Most Effective Direct Appeal Through Window — Little Expense Required to Make Good Showing—Ought to Have Permanent Background—Experience of Former Dealer May be Followed With Profit

I DECIDED that if my plumbing and heating business was to be a success it rested with myself, and would depend upon the exercise of my own initiative just in what measure the public's confidence would be entrusted to me. Having two competitors within the town which was to afford me my field, it was the more necessary to lay plans carefully and to put into them the same careful thought required in checking up my men's time or in billing customers on the completion of their contract or jobbing work. For, be it remembered, my competitors were well established and favorably known, and to "break" in on their connections was no mean problem. Any business I was to secure must be got fairly and on the service my organization was able to offer those wanting work done.

Some First Needs

In looking around my premises, there was no suitable place in which to conduct a proper department, either heating or plumbing. The needs of our town would mean that more or less steam heating could be secured in addition to the warm air heating that already had been somewhat developed, but which development had thus far been limited.

There was no basement under the store and I considered the question of adding one. The premises were rented, and at a favorable rental. Approaching the landlord, I was surprised when he intimated that he would have to ask nearly twice the rent to undergo the necessary expense of desired changes. However, the proposal seemed the only feasible solution, and the accommodation was provided. When completed, the space was ample for a good-sized workshop; for the development of a considerable business in warm air and steam heating, and for the early stages of the plumbing ventures about to be started.

Getting a Foreman

When the shop was being arranged for the problem of securing the right foreman presented itself. This was so important and vital that I decided to endeavor to procure the best man I knew —one who had served much time in many parts of Canada and who had a good record. His varied experience was such as to fit him well to meet and solve various problems that would develop. He was conscientious. He also was a graduate of the School of Practical Experience, in all branches, including tinsmithing, and his record left him with many excellent jobs to his credit and no poor ones. Could I secure him and could I afford to pay for the service he was able to render?

Well, to leave out particulars here, I finally secured this man, who proved to be a very wise choice. His estimates were accurate and his ability to map out work to advantage, unfailing. In this respect a high-priced man—if he can deliver efficiently, is generally worth his increased cost. Fear of this first cost has frequently been responsible for the "penny-wise, pound-foolish" experience of many a plumber and steamfitter. Good men are the only kind to employ.

The First Advertising

I am a believer in publicity. Although not located in a large centre I always used newspaper space freely. My outlay would run from $300 to $500 a year for advertising in the local papers alone. And I think it was money well spent. In the small community it is not always possible to trace "direct" results from this, but the advantage through creating a favorable and lasting impression is big. The rural reader of the paper is impressed favorably as to your importance among the businesses of the town or city. They have time to read, and from personal experience I know that they read advertisements that are well written. Any man who advertises can speak with his friends through the medium of his daily, semi-weekly or weekly paper in a conversational manner which they will not only appreciate, but which will, sooner or later, "bring him the bacon." It's a matter of initiative again, combined with natural personality.

Directness of Appeal

And so I made a simple and direct appeal for support of the new department that was being opened. This appeal was of a triple sort. The first two were those of the newspaper advertisement—either on the front page, or next the reading matter within. The other—and more personal appeal—was made direct through personal announcement by letter to a selected mailing list of those likely to be interested. This letter was brief and to the point, intimating the name of my foreman and stating his qualifications. Support was asked, in accordance with my ability to give a superior service. The newspaper announcements were also brief and made to read as interestingly as possible—for none like to read through a disjointed and mixed-up piece of advertising.

The Important Display

Having invested considerable money in a suitable stock of material it was now necessary to make the best use of this. I had a goodly amount of open floor space. This was cleared out and a nice enamelled bath tub placed well toward the front on the store floor. It was dusted out frequently, for if anything looks uninviting it is merchandise displayed for show purposes and clothed in a layer of dust. Since I knew that there would not be a great deal of space for every sample, I made this answer for the time being, but later a more complete showing of baths, basins and closets were made in the store. This always kept before those entering the store who might be sooner or later interested in the addition of a bath-room or the overhauling of their old one the fact that I could do this work. But the more important display and that upon which my effort was centred was that within the window.

How This Was Made

The background of the window, I decided, would have to be as nearly like the wall of an actual bath-room as possible. A little planning was therefore done.

Strips of one by four inch dressed lumber were procured and a skeleton framework built up at the back about 7 feet. This was done just as though it was to be lathed and plastered. The divisions were made so that a regular width of attractive tiled wallpaper would fit properly and to these strips the paper was tacked. It had been previously trimmed to match so that when the paper was in place the inside of the window looked, from the street, just like a regular bathroom. Of course the bath, basin, closet and tank had been placed on the floor of the window first.

It was now an easy matter to make the few artistic touches that were required and having arranged for a suitable floor covering of oilcloth, the whole effect was good. This was splendid in the daytime, but better at night. It was one of the most attractive and winning windows I ever had and well worth the time taken to make it and the small amount of outlay it called for.

In addition to a towel rack with towel a suitable chair was placed within, but the idea was to keep the window free from crowding and in fact to permit of placing a neat card within which read: "A Model Bathroom." Another card stated somewhat as follows: "We Do Plumbing; Estimates Furnished Free."

Other Displays

Other effective window displays were made of warm air furnaces. The window contained a furnace, fully cased and ready for setting up in the prospect's basement. When possible, two small capacity furnaces were used and one was set up without casing, and once in a while this was painted with aluminum paint to add to the effectiveness. The two furnaces always attracted attention.

In the foreground and around the sides were arranged registers and cold

air face and border plates. These added to the general advantage of the window and a coal hod, furnace scoop and ash shovels were used also. Register boxes, elbows, boots and fittings were shown. The doors of the ashpit and feed chambers were placed around the window, too. Cards were not forgotten and these would announce our willingness to figure on any kind of work contemplated.

Altogether, the time spent on interior and window display was considered a wise investment of time and what little money it cost.

What One Man Would Like To Do

"If I were again in the plumbing and heating business," said a former merchant to SANITARY ENGINEER last week, "I would do things a little differently. There would be some changes in my plans that I think surely, would be rather new as compared with those used generally in the trade.

"In the first place, I, like many of the craft, have been too modest in the past. Realizing that this trade is quite as honorable as any I would start out to impress this fact upon the citizens of my community. My men would be the best obtainable. I would pay them good wages and pay them promptly. They would have to 'toe the mark.' That is to say, I would have some short and definite rules that all my help would have to subscribe to and these would be somewhat after this nature:—

1. All men must work conscientiously.
2. Full time must be accounted for on time sheets.
3. Every employee must keep himself neat.
4. Bonus would be given "top-notchers" at end of month.
5. Every plumber would be given a set of white overalls and smock; also cap. (These must be worn on the job).
6. Small printed form would be given man going on job to give to customer (see below).
7. Estimates would be given in writing to customer and brief agreement signed before starting work.
8. A [illegible] would have to be paid monthly.
9. All employees would be required to attend weekly or bi-monthly conference.
10. Consistent, regular publicity program would be pushed.

"Some of the foregoing rules need no explanation. That regarding bonus—No. 4—I consider a good point. Competition would result in speeded effort and would make for neatness and eventual efficiency all around. The employee earning such bonus would make it worth my while to pay him the extra amount for his better service. If other men did reasonably well, they would be paid accordingly to show my appreciation.

By rigidly insisting upon the carrying out of rule five I would make an impression on the community at large in time. The men would have to keep their suits in neat condition once the garments were given them.

"Number six requirement would take the customer into our confidence. The form sent would read somewhat as follows:—

Dear Sir,—My plumbing department has been asked to undertake some work for you. This mechanic is a competent and duly qualified plumber and the nature of his engagement with me requires that he give you full satisfaction. He is required further to investigate the work you wish done. He will estimate this and make known to you the cost. If the price named is agreeable you will please sign the simple agreement following and we will complete the work as promptly as our complete service permits. Bill will be rendered you and payment expected within 30 days. The work will be subject to rigid inspection under the city's by-laws. All our contracts are so made and this agreement is expected of all clients. Any discourtesy or complaint you will please report direct.

"One of the most important points I would consider would be that of the publicity program.

"I would advertise regularly and pointedly in the daily or weekly newspaper. These appeals would be the same as I would make were I speaking with my prospect. Simple, direct, honest statements would convey my policy, my ideals and my terms. They would invariably be the same to everyone and I would make it a point to show no favoritism.

"In time I believe that I would win the confidence of my community and that these methods would win out. Do you think so?"

SANITARY ENGINEER believes that this man has the right idea in many ways. An honest try like that ought to bring results. Does anyone else want to try it out?

Discussion on the Main House Trap

Main House Trap Prevents Thorough Ventilation of Main Sewers—House Drain and Soil Pipe Stack Only Logical Way to Keep Atmosphere in Sewers and House Drains Free From Dangerous Gases—Several Sanitary Engineers Quoted Both for and Against

Discussion at meeting of American Society of Sanitary Engineers in Chicago

MR. THOS. J. LEE: What is going to become of the different cities that have laws, particularly in the State of Pennsylvania, which provide that house traps must be installed? The State of Pennsylvania has a law on its statute books which says that house traps must be installed.

As I understand it, the object of this society is to do the best it can in regard to this matter throughout the different cities and states. Pennsylvania has a law that has been contested in the highest courts of the state and found to be constitutional. Of course, the city of Pittsburgh happens to be the head city, and I wouldn't like to live in or build a house in a place where the neighbors next door didn't have a house trap and I didn't have one. If they want to ventilate sewers the cities of the different states should have standpipes, and in that way do away with the sewer air that circulates. I am strictly opposed to the motion by Mr. Claffy.

Mr. Devine: I think I have aired myself very fully as to the elimination of the main house trap at previous meetings.

Acting President: This discussion on the main house trap seems to be perpetual as far as these meetings are concerned. I can't remember being at a meeting of the society, of which I have been a member for several years, when the poor house trap didn't come in for its good share of the bumps.

However, the house trap is a very useful article, and in my opinion the house trap has been the means, many a time, of preventing sicknesses, and possibly epidemics, in the communities in which it has been used. The installation of the house trap undoubtedly needs some regulations, but if it is the intention by eliminating the house trap to ventilate the city sewers through the waste stacks entering in a building, then I believe we are all wrong in our theories.

The government recently has said that we shall install tile or concrete pipe drains in the houses. If we are forced into that condition then we surely should have and maintain on every sewer line entering a home or other building, a house trap properly installed, and installed so that it can be taken care of after its installation.

I should like to ask some of the advocates of the elimination of the house trap how they would like to live in close proximity to a contagious disease hospital, for instance, and have this construction in their homes which the government seeks to foist on us with no main house trap. I would like them to answer that with no equivocation in the matter. I, for one, would move out of the neighborhood of that description. I wouldn't feel as if it were safe to live in that neighborhood.

Last winter in the city in which I am fortunate enough to reside, we had some rather severe weather, and some days I had as high as twelve, or possibly fifteen complaints from residents that they had an abominable odor in their homes. Up-

on investigation we found in almost all of the cases that the stacks had become hoar-frosted, and that especially on the older installations the discharge of some of the fixtures had siphoned the smaller traps, letting the sewer air from the main sewer directly into the home, and that was where our old friend the house trap would have done very efficient duty. I believe the house trap should remain with provisions for its proper ventilation.

I do believe with some other of the delegates, and in fact I have seen it in practice, that stacks should be provided for the ventilation of the main sewers of any city.

Mr. A. C. Shaver: I don't believe there is any intention on the part of the government to compel us to use tile sewers in our houses after conditions become normal, and it is possible to get the articles that we would naturally use.

Speaking for the state of California, I made an investigation of the cities throughout the state, cities, towns, hamlets, and villages, and to my knowledge there is not one single house trap in the state of California, and we advertise our state as a health resort.

Mr. Devine: Mr. Chairman, I would like to ask you if Mr. Shaver hasn't a condition in California where he never has such low temperatures as in the eastern section of the country, where it is possible to have vent terminals freeze up. I would also like to ask if it isn't an impossibility to make a permanent tight joint on a crock or tile drain.

Of course, I don't want to take up too much time on this subject, but I have seen cases where it was absolutely necessary to install a main house trap to prevent the entrance of sewer air. I feel that if sewer air is dangerous and detrimental to public health we should use all precautions to keep it outside of the buildings. If we have got to ventilate our street sewers, let us recommend a system not at the cost of the health of our home dwellers. I feel that we are capable of handling that if it is necessary, but I don't think it should be done through a system that endangers the health of a community.

Acting President: I'd like to call the attention of the members to the fact that we shouldn't in this discussion confuse the recent regulations by the material section of the War Industries Board, that is, pertaining to tile pipe and matters of that kind, with the motion which is before us, which, as I understand, is for the elimination of the house trap. We are talking of the house trap as it has been used normally, and as we expect it to be used normally, not under regulation of war, but under regulation of peace, because we are certainly not trying to establish a special standard and code for war conditions and then other standards for peace conditions. It is quite appropriate that we should discuss the matter of tile pipe, but not in connection with this motion.

Mr. Rainger: Mr. Chairman, I hope all of the delegates here in convention assembled before they vote on this question will kindly remember the motto of the society: "Prevention rather than cure."

Mr. Wm. T. Galloway: As a representative of Kansas City, I want to go on record that we are in favor of the house trap.

Mr. C. B. Ball: One of the tests of the new idea is whether or not it makes progress. As I look into your faces I see a good many young men who were not framing regulations twenty-five years ago when about the first regulation of this kind, allowing the elimination of the house trap at the option of the owner of the building, was put into the regulations, newly framed for the city of Washington, D.C. It was a tremendous innovation, and many of the plumbers thought it was a dangerous thing to do, but the plumbers of Washington, D.C., if you will allow me to say it, are an exceptionally progressive group of men, and some of them were disposed to try the new proposed construction, and it was not very long before they thought it was a good idea. It was not many years, fifteen or so, before it became universal in that city.

The elimination of the house trap is now prescribed by the regulations of the District of Columbia. In introducing such a marked innovation, it was first allowed in the case of new sewers only, where the air conditions which prevailed in the sewers were better than is the case in many old sewers. There are many cases where house drains are equipped with traps for long distances on an old sewer whether or not it would be desirable that a single, new drain, connected to such a sewer system, should have its trap omitted. The reason for this is entirely clear that that particular stack system would, of course, be overtaxed in its efforts to perform the work of ventilating the main sewer.

There is absolutely no question (and I base this on a wide experience and observation) that in a new sewer system, such as is constructed de novo in many towns, it is exceedingly desirable to generally omit the house trap and its fresh air inlet, and I have no doubt that in many old systems it can be done with a very great desirability.

Some argument has taken place here respecting congested quarters of our city. It seems to me that those who have designed plumbing for congested streets with narrow sidewalks will agree with me that no one has yet found in such situations a proper place for a fresh air inlet. If such a situation could be found I would be pleased to know what it is. One of the necessary evils of a main house trap construction is that you must provide entrance for air from the outside at that point. That, in many situations, is impossible. If you take the cities in which the construction of the trap is deemed essential and is still required by the ordinances, you may go from house to house and block to block and find one after another of the fresh air inlets either absolutely closed out of sight or with its grating so constructed as to be practically useless. As soon as the fresh air inlet is useless your trap then becomes an obstruction.

The best argument ever made for the omission of the house trap was that the proper design of a plumbing system for any building requires the immediate discharge of every drop of sewage to the main sewer just as quickly as that is possible. Any trap or any type of construction which retains any of the decomposing substance or sewage is an objectionable matter, and any trap which can be safely omitted in any system because it retains sewage unnecessarily should be so omitted.

At the present time every prescribed system of plumbing is under criticism as to whether or not it is the simplest form or system which can be safely used. Such criticism is desirable, and it is only by wise criticism that we can come to the best results in deciding plumbing systems.

If, in our effort for simplification, we provide, as some have suggested, an outside vent with a main sewer, we certainly are going in the wrong direction if the vertical lines which are already deemed necessary can be properly used for such purposes, as I believe they can if they are generally applied to an entire sewer system.

There is no one simplification so easily made as to omit entirely in all new constructions connected to new sewer systems the house trap and its pertinence, the air inlet. (Applause.)

Acting President: We will be pleased to hear any further remarks on this topic, gentlemen.

Mr. Claffy: Mr. Chairman, I don't like to be on the floor all the time, but as I started this I suppose I had better hold the bag. I think one of the strongest arguments that was ever made in favor of the house trap, and the one, in fact which allowed the Canadian Institute of Sanitary Engineers some years ago at their convention to not exactly recommend its use, but to not legislate against it, was this: That in cities like Winnipeg, Montreal, Ottawa, and in other cities in the far northwest of Canada, where a temperature of 40 degrees below zero maintains for several weeks at a time, the main sewer, the house drain and house systems were frozen up because the circulation of air down through the manhole and through the house drain and plumbing system in the buildings was too strong. It froze the house drain. By putting in the main house trap they cut off that circulation of air and prevented, in a great measure, the freezing of those lines. That was the only solid argument that they could find in favor of the house trap after considering every other phase of the question. They had before them at that time the report of the Royal Sanitary Institute of Great Britain. As I said before, it took them five years to study that question, or rather they took five years in order to do it right. They had journeymen plumbers, master plumbers, and everybody they could get who had any experience, who all had a say-so. The result of all that was their condemnation

of it as a necessary element in plumbing and building.

As far as the house trap keeping sewer gas out of the building, that doesn't agree with the facts at all. In a great part of Chicago the sewers are under a full head of water practically all the time. There isn't very much gas developed in a sewer that is running full of water. The greater part of the gases are developed in the line that is occasionally full, but most always empty, and it is the decaying animal and vegetable waste on the wall of that pipe that eliminates the gas that is so destructive to plumbing systems and is such a nuisance within buildings.

When you put the main house trap on your system, what do you do with it? You cut off the circulation of air from your street sewer. Then you say, "How are we going to circulate it if the sewer is full of water?" The fact of the matter is you don't get much circulation under these conditions. But very few cities have the conditions that we face in this down-town section. In the outlying sections we have a larger set of sewers, not so high-water level, and greater circulation of air. Some of the sewers down here on the main streets are 18 in. in diameter; they ought to be 3 ft.; they would be better if they were 6 ft.

If you cut off the circulation of air in that pipe, what do you do? You stagnate that air. You induce the propagation or the elimination, rather, of your waste matter more rapidly because of the heated condition of that air, the gases are developed quicker, the process of decay is increased, you have a greater concentration of gases, a more destructive gas on your pipe system, a greater nuisance in your system, and you have got a condition altogether that without a proper circulation of air is abominable. It is only by circulating the air through your plumbing system that you have a means of so controlling the process of decay that the objectionable matter in there is not too pronounced, that your process of decay is not too rapid, your gas is not evolved in a concentrated form, and by circulating the air you tend to rapidly dry the walls of those pipes. You circulate that air through the building, and a proper circulation of air means a less concentrated gas, a less rapid action on your pipe system, a less nuisance.

I think that was best illustrated in one of the buildings down town which we investigated a few years ago and mentioned in this report, where a relief vent was put in. It was found that this relief vent, although it has been in about six years, is practically the same as when it was put in—a galvanized steel strength. The current of air through that pipe has a velocity of up to 24 to 32 hundred feet a minute. To better illustrate what that velocity means—during a high velocity it will blow an ordinary hat off the vent pipe. It would take some draft of air to do that, but the free circulation of air in that pipe eliminates the action of the gases. There isn't a chance for a condensation under a cooling atmosphere for an acid to form from the gas so that it can corrode or disintegrate the galvanizing or the pipe itself.

When you cut off that circulation of air you set about the conditions that produce rapid decomposition, and if we are here for anything, gentlemen, we are here to maintain the integrity of the things we stand for, and we are here to stand up for the best system for the man's money. We don't want to advocate the installation of a plumbing system that, because of a lack of proper materials and design will only last ten years where it should last a hundred. We are here to elevate standards. We are here to bring about conditions that will give the man the most for his money. I don't mean the most junk, but the best of everything. We don't want stuff that we will be ashamed of five or ten years from now. That is why I think the main house trap has no place in the average plumbing system of the country, and anything we do need make no difference as far as a man's local ordinance is concerned. If his local conditions demand the use of a house trap he should have it, but if he is convinced and the men with him in that city are convinced that it is like two tails on a dog, then he has got the action of a body like this to back him up in his position before his local council. That is about all that you can do with it. If a man has an ordinance that requires six house traps on a drain, it is up to him. He doesn't have to be bound by anything we do, but if we go on record for something we are sure is for the best in sanitary engineering, he has something to fall back on and has a prop to lift him over the rough spots.

Mr. Donahue: In our city we don't use a house trap as they call it. Our sewers run down into the Illinois River, and I never could see in that locality any use for a house trap. They are used in some of the cities away from our place there. How many plumbers or inspectors either who are around houses doing repairs and looking after different phases of the plumbing ever go near a house trap? How many of you ever look at the house traps? The man who owns the building never has it looked at.

In a great many places where plumbing is done, sinks are connected right into the drainage system without any catch basin. That all goes into the drainage and into the house trap. It is bound, after a while, to get foul. It is never looked at until it is stopped up. I think from my own personal observation that it is a nuisance. There are localities where it may be of use. In our surrounding countries around there where there isn't any inspection of plumbing, and a good many places where there is, I have seen a house trap put on a main sewer, put out in the yard and covered up—no fresh air inlet or anything else. That, of course, is a detriment to the whole system. For a good plain system of plumbing we could eliminate the house trap, especially in Illinois.

URGES LABOR TO BE GUARDED IN ACTIONS

Tom Moore, president of the Trades and Labor Congress of Canada, has issued a letter to the trades unions, in which he announces the fact that the right-to-strike legislation of the Dominion government has been repealed, and also intimates that a representative of labor has gone to the Old Country with Premier Borden to have some part in the peace conference. Regarding the conditions in the country, under these conditions, he says:

"It is to be hoped that, with the removal of these restrictions that the unrest caused amongst the members of our affiliated organizations will subside. The best judgment and efforts of all men will be required during the future months to avoid chaos during the readjustment period of this country.

"With the cessation of war and the discontinuance of munitions manufacturing, the possibility of serious unemployment faces us. As a temporary measure, requests have been made to the Minister of Labor that all government work be placed on an eight hour day, with the forty-four hour week, and an appeal issued to other employers to do the same in order that employment can be distributed between the greatest number of workers. Other measures such as the opening up of public works and the use of day labor thereon, eliminating the contractor, and making possible the use of all grades of unemployed labor, has also been suggested to the government."

TAKE THE LOAN!

(Written in May, 1861.)

Come, freemen of the land,
Come meet the great demand,
True heart and open hand—
Take the loan!
For the hopes the prophets saw,
For the swords your brothers draw,
For liberty and law,
Take the loan!

Ye ladies of the land,
As ye love the gallant band
Who have drawn a soldier's brand,
Take the loan!
Who would bring them what she could,
Who would give the soldier food,
Who would staunch her brother's blood,
Take the loan!

All who saw her hosts pass by,
All who joined the parting cry,
When we bade them do or die,
Take the loan!
As ye wished their triumph then,
As ye hope to meet again,
And to meet their gaze as men,
Take the loan!

Who would press the great appeal
Of our ranks of serried steel,
Put your shoulders to the wheel,
Take the loan!
That our prayers in truth may rise,
Which we press with streaming eyes,
On the Lord of earth and skies,
Take the loan!

EDWARD EVERETT HALE.

October Building Operations

The Building Operations Throughout Canada Appear to be Slackening—For the Ten-month Period the Canadian Total is Still Well Ahead of the Previous Year

BUILDING in Canada, as evidenced by the value of permits issued by Canadian cities, has been showing a tendency this fall to decline. In the earlier part of the year the industry showed up fairly well all things considered, and as compared with the corresponding months of last year, good gains were recorded. The months of September and October, however, have been alike disappointing, and already the improvement shown up to about August is being slowly wiped out.

An examination of the accompanying table discloses the fact that in both east and west there was a falling-off which aggregated over half a million dollars for the month. The twenty-four eastern cities reporting experienced a decline of $337,595, and the twelve western cities of $206,975. Eastern cities for the ten months ending with October, are now nearly a million dollars behind. Western cities maintain their lead over 1917 by over two millions, their excellent showing saving the day for the whole country, which has still a lead of $1,274,859 over last year.

With the exception of Peterboro,' there are no important changes for October. In Peterboro, there is to be noted a decline of $780,762, which is accounted for by the fact that it is just a year ago since the Quaker Oats' permit was issued there. Toronto, which is usually to be counted on for a conspicuous change one way or the other, breaks nearly even with a decline of $5,024. Montreal, on the other hand, records a gain of $152,117, though its permits for October were only half those of Toronto. There is the usual gain in Halifax, which this month runs to $161,526.

In Western Canada, the greatest change is shown by Vancouver, where permits amounted to $70,825, as compared with $233.975 a year ago. In Edmonton building fell off to only $6 200, a decline of $74,300. On the other hand Winnipeg at $95.000 enjoyed an increase of $22,700, and Moose Jaw at $76,370, an increase of $71.720.

For the ten month period, several heavy changes are shown. Thus in Halifax, owing to the reconstruction work that has been in progress this year, building has boomed and from only $795,944 in 1917, values have jumped to $2,456,558. In Quebec on the other hand, there has been a slump of over a million dollars. Ottawa, with government buildings going up this year, has had an increase of $1,594,237, but Toronto is back by $1,156,931.

With the exception of Brandon and Winnipeg every western city reporting has enjoyed an increase, ranging from $17,695 in the case of New Westminster, to $616,600 in the case of Calgary. While the amounts involved are smaller than in the east, this showing is most encouraging, indicating as it does that western conditions are steadily improving.

Building Permits For the Month of October

	Oct., 1918	Oct., 1917	Change	10 mos., 1918	10 mos., 1917	Change
Eastern Cities						
Maritimes—						
Halifax	$ 217,361	$ 55,835 +	$ 161,526	$ 2,456,558	$ 795,944 +	$1,660,614
St. John	17,100	6,100 +	11,000	348,823	521,250 —	172,427
Sydney	47,500	46,068 +	1,432	379,207	359,600 +	19,607
Quebec—						
Montreal	$ 379,150	$ 227,033 +	$ 152,117	$ 4,367,353	$ 4,079,698 +	$ 287,655
Quebec	9,067	76,415 —	67,348	829,741	1,954,041 —	1,124,300
Lachine	11,250	18,335 —	7,085	229,820	250,033 —	20,213
Westmount	40,750	5,125 +	35,625	262,811	136,490 +	126,321
Ontario—						
Brantford	$ 5,900	$ 21,965 —	$ 16,065	$ 629,990	$ 111,945 +	$ 518,045
Chatham	9,800	43,950 —	34,150	132,190	350,272 —	218,082
Fort William	2,400	8,900 —	6,500	480,725	645,915 —	165,190
Hamilton	180,855	198,095 —	17.240	1,788.469	2,325,350 —	536,881
Kingston	35,033	18,132 +	16,901	292,040	136,851 +	155,189
Kitchener	29,515	15,275 +	14,240	234,397	193,587 +	40,810
London	277,650	143,460 +	134.190	737,990	718,290 +	19,700
Ottawa	205,078	93,625 +	111,453	2,519,954	925,717 +	1,594,237
Peterborough	37,113	817,875 —	780.762	235,544	945,933 —	710,389
Port Arthur	2,175	830 +	1,345	602,566	1,336,502 —	733,936
Stratford	5,460	4,529 +	931	88,626	209,488 —	120,862
St. Thomas	2,160	3,140 —	980	45,285	76,720 —	31.435
St. Catharines	49.267	38,520 +	10,747	437,003	458,105 —	21,102
Toronto	781.201	786,225 —	5,024	6,375,079	7,532,010 —	1,156,931
Welland	16,525	21,004 —	4,479	418,004	226,184 +	191,820
Windsor	30.530	93,450 —	62,920	490,670	1,085,385 —	594,715
Woodstock	21,303	7,852 +	13,451	115,298	90,535 +	24,763
Total 24 E. Cities	$2,414,143	$2,751.738 —	$ 337,595	$24,498,143	$25,465,845 —	$ 967,702
Western Cities						
Manitoba—						
Brandon	$ 7,750	$ 2.380 +	$ 5.370	$ 80.676	$ 177.938 —	$ 97,262
Winnipeg	95.000	72,300 +	22.700	1,987.750	2,156.250 —	168,500
St. Boniface	3,160	5,000 —	1.840	253,115	70,265 +	182,850
Alberta—						
Calgary	$ 76,000	$ 123,000 —	$ 47.000	$ 1,127,000	$ 510.400 +	$ 616,600
Edmonton	6.200	80,500 —	74.300	322,270	304.200 +	18,070
Lethbridge	6,545	12,650 —	6,105	130,933	80,968 +	49,965
Saskatchewan—						
Moose Jaw	$ 76,370	$ 4,650 +	$ 71,720	$ 516,495	$ 260,710 +	$ 255,785
Regina	40,450	42,800 —	2,350	952,740	396,170 +	556,570
Saskatoon	22,130	37,475 —	15,345	587,315	515,905 +	71,410
British Columbia—						
Vancouver	$ 70,825	$ 233,975 —	$ 163,150	$ 1,287,993	$ 676.885 +	$ 611.108
Victoria	10,575	10,150 +	425	218,125	89,855 +	128.270
N. Westminster	7,500	4,600 +	2,900	93,060	75,365 +	17,695
Total 12 W. Cities	$ 422,505	$ 629,480 —	$ 206.975	$ 7,557,472	$ 5,314,911 +	$2,242,561
Gr. Total 36 Cities	$2,836,648	$3,381,218 —	$ 544,570	$32,055,615	$30,780,756 +	$1,274,859

SAVE 106,000 TONS OF COAL
Great Britain Puts 400 Experts to Work to Eliminate Waste

Four hundred experts have been appointed by the British coal controller to consult with and advise steam-power users how to eliminate waste. As the result of an inquiry by the Coal Control Technical Department, it is clear that a great deal of preventable waste of coal is going on. It will, however, take several years to recover the whole of this loss, even if a supreme effort is made by all the industrial firms, as it was impossible to instal more efficient plant during the war. Another cause of waste of coal is the employment of unskilled stokers, and, unfortunately, there are to-day perhaps more men of this description than at any other time, as so many skilled stokers have joined the army. There are 45,000 users of steam plant in Great Britain. Up to the present reports on 364 firms have been carefully scrutinized, and it is estimated that a saving of approximately 106.000 tons can be effected without any serious alteration to plant.

SANITARY ENGINEER

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A SPLENDID MOVE

WE have in this issue a splendid piece of information to give out to the trade. Here it is. The Canadian brass manufacturers got together some time ago to discuss the question of elimination and standardization of lines manufactured by them. They decided to eliminate as high as 70 per cent. of the styles in use and made at the time of writing.

At first the subject was taken up as a war measure, and there is some doubt as to whether this decision will be carried out as a peace measure. SANITARY ENGINEER sincerely hopes that it will be.

One of the greatest curses to the sanitary and heating trade is the great variety of lines carried and installed. Look at the number of sink cocks, basin cocks, etc., that there are, and 90 per cent. of them all fit a half-inch pipe fitting, or in the case of a basin cock, a quarter-inch tailpiece is used.

However, a large quantity are to be put off the market, and seeing that such is the case it should be the aim of every member of the trade to do his level best to help the move by not demanding such goods as have been eliminated. And when repairs for the obsolete lines are asked for, to suggest to their customers that one of the standard lines be used instead.

In this connection would it not be well to have every town or city plumbing by-law standardized? Every member of the craft would do well to bring pressure to bear upon the powers that be to have a uniform plumbing code compiled. This can only be done by the Federal authorities and as the Canadian Society of Domestic Sanitary Engineers are to hold a convention in Montreal this year, this subject should be given some attention.

There need be no interference in municipal or provincial power, no changes except of a very minor nature to those plumbing by-laws already in operation in most of our large towns and cities, but some form of by-law to be operated in every case where there is plumbing and sanitary fixtures installed.

As matters stand to-day, there are hundreds of towns and villages that have no plumbing by-laws and no efforts made to have sanitary fixtures installed in a proper, workmanlike manner; the town tinker becomes the plumber and his work is never inspected. Wells are being polluted, filthy conditions are created all over the Dominion.

RISE TO THE OCCASION

WE are asked by quite a number of the trade as to the outlook in the near future for the plumbing and heating trade. Some are intent upon waiting for something to turn up, resting on their oars and looking on.

Now, what is likely to be the outcome from a lot of onlookers? Suppose we were all to become Micawbers and wait for something to turn up? How would the world fare? That's the question which should be asked as an answer to those inquirers. The chief thing is that instead of asking such questions, everyone should start right in and do something.

Just to show what can be done, here is an incident which took place a couple of months after war broke out in 1914. A certain member of the craft made a few mental deductions and said to himself, "Well, boy, here you are; not a job in sight! Ten men all in the shop, every job finished up. Every one of my men married, have a bunch of chicks to feed. What about it, boy?"

That evening he made a list of his customers and determined to go after them for some work. He cleaned up all kinds of work. Furnaces were cleaned. New smoke pipes made. Furnaces were covered, extra radiation put in and in a number of cases new and larger furnaces were installed. In fact, most of the winter found his men all kept busy the best part of their time. This was real good work on the part of that sanitary and heating engineer.

It might be argued that conditions are different now. To such a statement we would be inclined to say that such a reply is scarcely in keeping with facts.

In those days material was for a time plentiful, and so was help. But it must be remembered, too, that houses were plentiful, as also was labor and material. Very little demand for anything of a peace nature. To-day, while material is somewhat scarce, and labor, too, the demand for houses is high, and just as soon as plans for building houses are completed there will be the available material and labor.

The Waste and Abuse of Steam

A Paper Read Before the Providence Engineering Society — Every Heating Engineer Will Do Well to Read This Article

By HENRY W. BALLON

THE aim of this paper is to contribute to the current public discussion on the conservation of coal. It is an endeavor to combine and set forth some of the views of four local engineers who have had experience with the more popular methods of wasting steam in Rhode Island.

There is to-day within fifty miles of Providence an industry employing 5,000 people, which is the last word in systematic scientific management. Its prime movers consist of no less than six small non-condensing engines. For half of the year nearly all the exhaust steam belches to the atmosphere; for the other half a large part is used for heating. The hot drip from the heating system, instead of being returned to the boiler, flows to the sewer, while the annual bill for the feed water amounts to several thousand dollars. There are literally hundreds of similarly flagrant cases.

What the typical Rhode Islander manufacturer needs to help him conserve coal is not information about the refinements of the economic use of steam. but ceaseless reiteration of the simplest platitudes about steam. Platitudes as simple as this:

If steam can be seen anywhere out of doors, coal is being wasted.

Another platitude would be:

Are your steam traps and valves leaking coal all of the time? Do you have periodic inspection and reports as to their condition?

These platitudes are ridiculously elementary, but it is doubtful if one plant out of fifty in Rhode Island has any periodic inspection and reports on these vital matters. For illustration, about a year ago the owner of a new plant using central-station electric power complained that his heating system took too much steam and that his boiler plant was not of sufficient capacity. On investigation it was found that the otherwise frozen ground was soft and moist for a considerable distance around a certain cistern. The bypass on a steam trap serving the sprinkler tank had been carelessly left open, and live steam to the tune of several tons of coal per day had been wasting through the trap into the cistern for several months. This is typical Rhode Island cause of deficient boiler capacity.

Steam Traps

Hundred of cases come under observation where steam traps are either leaking or are bypassed and where the leakage is a source of direct waste. The discharge from traps is frequently connected directly to the sewer or to mill trenches where leakage is invisible, and waste may go on for months and even years undetected. This subject of leaky traps is a long story, but therein lies a great possibility. Nearly every steam plant has steam traps, and sometimes there are hundreds of steam traps in a single factory. Yet it is probable that not one plant in ten has its traps so equipped and connected that they can be readily tested for leakage. It is the opinion of a number of engineers that of all the steam traps in Rhode Island today, probably over 75 per cent. are either leaking, are bypassed or are in some way failing to serve their purpose purely for want of regular supervision.

Lax Operating Conditions

There is a large finishing plant in which, a few years ago, an engineer was "turned loose." Within a few months the load on the boilers was reduced fully 1000 boiler horsepower with practically no expense for new equipment, but simply by stopping gross leakage and waste. The most obviously needful changes were often secured with difficulty or secured only in part. In one department there were three sets of large can driers, each set being served by a 2-in. live-steam pipe and a 6-in. exhaust-steam pipe.

Most plants keep their piping systems fairly tight where the pipes are in plain view; but leaky joints on hidden pipes, leaky valves on connections between live and exhaust systems and on drains, etc., are common. It has been found helpful in large plants having many piping connections, to go through the plant late at night when everything is quiet (both out of doors and inside), at which time it is easier to detect the sound of escaping or leaking steam.

Large plants should be equipped with valve reseating tools and should use them whenever necessary to maintain all steam valves in proper condition. This is another matter that should have systematic attention.

Heating of Water

It is quite common in plants using large quantities of hot water to find this water being heated by live steam, while at the same time exhaust steam is being wasted to the atmosphere. This matter needs little comment as it is obvious that great economies can be effected by using exhaust steam for this purpose.

Boiling With Live Steam

In cloth-finishing plants and dyehouses there are many processes, the nature of which makes it necessary to boil large tubs of water with direct steam and maintain them at the boiling point sometimes for hours. Large wastes can occur in this operation, because the amount of steam that can be turned into apparatus of this sort is limited only by the sizes of pipe connections thereto. It is evident that the temperature cannot be increased after the liquid reaches the boiling point. This is a difficult matter to control, as the men handling such apparatus are usually not in the least interested in where the steam comes from or what it costs.

Automatic temperature regulation can be applied to some work of this character under some conditions, but the sovereign remedy is systematic, skilled oversight and eternal viligance.

Insufficient Boiler Capacity

Another instance of the typical Rhode Island cause of insufficient boiler capacity may not be irrelevant. The management of a thriving, manufactory suddenly concluded that its steam supply was inadequate. It was immediately realized that two new boilers and a new chimney and appurtenances were needed, *and in a hurry.* (Intense hurry is apt to be one of the most distressing symptoms of this disease.) It is the usual custom in such cases to ask the gentlemen who sell boilers and other things to supply the engineering. They do engineering free of charge. But in this instance the management called in an engineer. Instead of installing two new boilers, he shut down one of the old ones. At the end of the next year, during which the business had increased by some millions of yards of cloth, the cost of coal consumed had decreased $8,000. This saving was attained by stopping the waste of steam in the dyehouse and by using exhaust steam.

Exhaust steam was used to preheat large quantities of water, instead of putting cold water into dye tubs and bringing it to a boil with live steam as was done previously.

Exhaust Steam

There is, on the part of owners and managers, a universal prejudice against exhaust steam. This prejudice also extends to superintendents and foremen, and it becomes virulent with the workmen. They all know that high-pressure steam will make more commotion and racket than exhaust steam. They know that high-pressure steam will make water boil harder. Most manufacturers are confident that there is some magic property in live steam that is lacking in exhaust steam, even at the same pressure; their head dyers tell them so.

A large part of the failure of some exhaust-steam systems is attributable to a feeling that exhaust steam is cheap—doesn't cost anything—and may therefore be wasted with impunity.

A perpetual campaign of education, remonstrance and expostulation is necessary to prevent the waste of both live and exhaust steam in dyehouses and finishing plants. In the previously mentioned plant where the coal bill was reduced $8,000 in

a year of increasing business, it is safe to say that the gain would have all been lost in the following year if previous conditions of oversight and management had been resumed.

Platitudes for exhaust steam should be about as follows:

Nine-tenths of the coal used in making steam goes into latent heat.

In making steam nine-tenths of the coal is used before we get an ounce of steam pressure.

When you waste exhaust steam, you waste nine-tenths of the coal used in making live steam.

There are many processes where, with slight changes in the method of drainage, etc., exhaust steam may be used in place of live steam. This is particularly true in cloth-finishing plants, paper mills, rubber works and similar industries, where large quantities of materials have to be dried.

One of the most prolific sources of waste is in the throwing away of the condensed steam in the form of hot or warm water. It should be the aim of every manager to see that no heat is lost to the air or to the sewer, which may be recovered.

Steam was kept turned on in both pipes at the same time, despite repeated protests to the manager, the master mechanic and the chief engineer. Of course the live steam was immediately reduced to exhaust-steam pressure, to the end that large quantities of steam went to waste through the back-pressure valve in a remote part of the low-pressure piping system without the slightest advantage to the driers. This is an excellent illustration of the objections to having high and low-pressure connections to any one piece of apparatus.

This same plant had a large air compressor driven by a cross-compound Corliss engine. It was desired to carry a nearly constant pressure in the compressed-air receivers, and to accomplish this the engine was throttled by hand, running probably 95 per cent. of the time at a speed below which the valves would cut off automatically; in other words, taking steam the full stroke. This engine was equipped with a surface condenser which was not in operation, the engine exhausting directly to the atmosphere. A test was made of the engine as found running, and again when operating condensing and with the valves cutting off properly. It was found that the saving due to operating the outfit as intended by the makers was in excess of 125 boiler horsepower.

Blowoff Valves

Probably not one steam boiler out of a hundred in Rhode Island has the boiler blowoff valves so arranged that they may be readily tested for leaks. Moreover, it is fashionable to submerge the end of the blowoff pipe in some river or brook so that no offensive steam cloud caused by leakage will be perceptible. The blowoff platitude would be as follows:

Are the blowoff valves so connected that they may be readily tested every day?

Pipe Covering

Pipe covering is almost an axiom of steam economy, yet there is no systematic periodic inspection and recorded report on the condition of this most thrifty means of saving coal. It is a popular custom not to cover the flanges because of the inconvenience when a joint leaks.

Excessive Back Pressure on Engines

Where steam is used for heating and drying purposes, it is often economical to operate engines and other prime movers against back pressures. Under these conditions every effort should be made to have this back pressure as low as possible. In one instance, where a single back-pressure gauge was in use, it was stated that 1 lb. back pressure was all that was required. But the gauge in use and which indicated a pressure of 1 lb. was found to be nearly 4 lbs. in error due to faulty piping, and the back pressure was in consequence nearly 5 lbs. The platitude in this case would be:

Test the Pressures Periodically

In many cases the back pressure has been reduced owing to a more efficient circulation of steam by vacuum heating systems or other means. Plants running condensing can frequently obtain a better vacuum by eliminating air leaks, etc. It is not unusual to find a poor vacuum caused by insufficient condensing water which latter is caused by obstructions in the piping such as leaves and accumulations of foreign matter.

Back Pressure and Reducing Valves

At least four cases have been observed by one engineer where live steam was blowing directly the low-pressure steam system. These were in the case of a supposedly insufficient supply of exhaust steam, where live steam was being admitted to make up the supposed deficiency. At the time the live steam was being admitted through a reducing-pressure valve or by hand control, the back-pressure valve was partly open, allowing the escape of steam direct to the atmosphere. The remedy is to install properly sensitive back-pressure and reducing-pressure valves so arranged and set as to pressures that it will be impossible for such waste to occur.

Heating System

As a general statement it can be said that little or no attention is paid to securing economical operation of heating systems for buildings. Many plants operating noncondensing engines have a surplus of exhaust steam available for heating at all times when the prime movers are running. Under these conditions this steam is likely to be carelessly used, there being a feeling that, because it is exhaust steam and there appears to be no other use for it, it is not necessary to use it economically —the result oftentimes being that radiation is not properly trapped and that various drains and bleeders discharge directly to the sewer. Under these circumstances waste of live steam occurs at night and on holidays, at such times as the heating system must be operated with live steam, which in this climate in an ordinary manufacturing plant is a considerable number of hours yearly. Obviously, all open ends become sources of waste when live steam is in use.

Exhaust steam, where available, can frequently be substituted for live steam in heating coils with slight changes in the equipment.

In some cases it has been found possible to extract a certain amount of steam from a compound condensing engine or turbine such steam first performing a certain amount of mechanical work and then giving up its latent heat (amounting to 90 per cent. of the total heat) to the heating system. A specific instance may be noted where in a cotton-mill plant, the steam which passes through one of the turbines is used in the heating system during the winter months, the unit being operated condensing in the summer months. This is a change made during the present winter which has resulted in a reduction of the load on the boiler plant amounting to more than 200 horse-power.

Hotel-heating systems are as a rule very wasteful, because there is a great tendency toward overheating. Many mills, office buildings, etc., are overheated during most of the winter months. Automatic temperature regulation is in many cases a desirable and profitable adjunct to a heating system, for it prevents overheating.

Some of the older vacuum heating systems are wasteful in that considerable quantities of water are required at the vacuum pump to assist in maintaining a vacuum. This condition is frequently caused by improper automatic expansion valves on the return ends of the radiators, in many cases it having been found that the interiors of the valves have been entirely removed, allowing the steam to be pulled through into the return line. Several cases have been observed where large quantities of water were being injected into the vacuum pump and delivered by the pump to an open heater or receiver, and from there overflowing (in the form of hot water) to the sewer.

Leaks

Leaks in pipe joints and flanges are a source of waste larger than is sometimes supposed. The cumulative effect of a wee jet of steam moving perhaps a mile a minute during 24 hours a day is considerable.

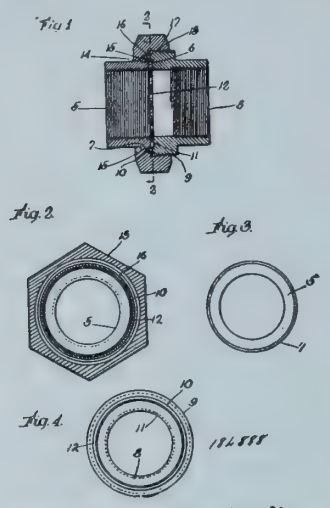
Years ago it was the rule to provide large size blow-off pipes and use them for feeding the water, but modern ideas seem to be to run the feed line somewhere near the water line. The writer has never yet been able to figure out where the benefit of this top feed really comes in, while feeding through the blow-off at least protects it from the heat by good circulation.

New Canadian Patents

No. 184,888.

The Jefferson Union Company, Lexington, Massachusetts, assignee of John N. Goodall, Portsmouth, New Hampshire, both in the U.S.A., 11th June; 6 years. Filed 21st March, 1917. Rereceipt No. 277,250.

Claim.—1. A coupling comprising a drawing member having a bore embraced by a lip and an annular bevel compres-



No. 184,888. Pipe Coupling.

sion shoulder, said member having also a threaded bore larger than said shoulder, a collar member having a shoulder to receive said lip and an expansion member, and a second collar member having a thread to be engaged by the thread of said drawing member, and an endwise extending wall to be received and compressed as to its edge between said expansion and compression members.

2. A coupling comprising a drawing member having a bore embraced by a lip and an annular bevel compression shoulder, said member having also a threaded bore larger than said shoulder, a collar member having a shoulder to receive said lip and an expansion member, and a second collar member having a bore, an exterior thread to be engaged by the thread of said drawing member, a wall of larger diameter than the bore of this latter member and having parallel surfaces, and an annular seat closely fitting against the inner surface of said wall and having its edge bearing against the step between said wall and the bore of said latter member, said wall adapted to be received by said compression shoulder, of the drawing member and to receive said expansion member.

No. 184,666

Henry Paxton Baird, Toronto, Ontario, Canada, 4th June, 1918; 6 years. Filed 10th January, 1918. Receipt No. 289,654.

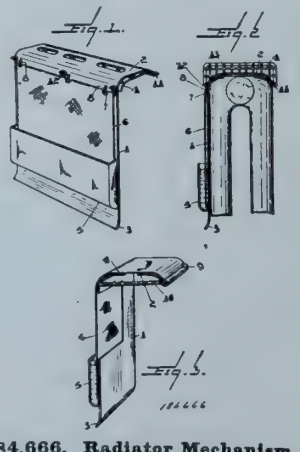
Claim.—1. In a device of the class described, a metallic shield comprising an apron adapted to hang behind a radiator and provided with an outwardly turned flange at its lower edge, an apertured top adapted to fit over the top of the radiator, and a piece of air filtering material adapted to close the openings in the apertured top.

2. In a device of the class described, a metallic shield comprising an apron adapted to hang behind a radiator, an apertured top adapted to fit over the top of the radiator, and a piece of air filtering material adapted to close the openings in the apertured top, in combination with a water pan formed on the back of the shield.

3. In a device of the class described, a metallic shield comprising an apron adapted to hang behind a radiator, an apertured top adapted to fit over the top of the radiator, and a piece of air filtering material adapted to close the openings in the apertured top, in combination with a water pan formed on the back of the shields and a strip of absorbent fabric dipping into said pan and secured at its upper edge to the upper part of the device.

4. In a device of the class described, an apertured top adapted to fit over the top of a radiator, a piece of filtering material adapted to close the openings in the top, a water pan adapted to hang at the back of the radiator, means for supporting it from the top of the radiator, and a strip of absorbent fabric dipping into said pan and secured at its upper edge to the upper edge of the device.

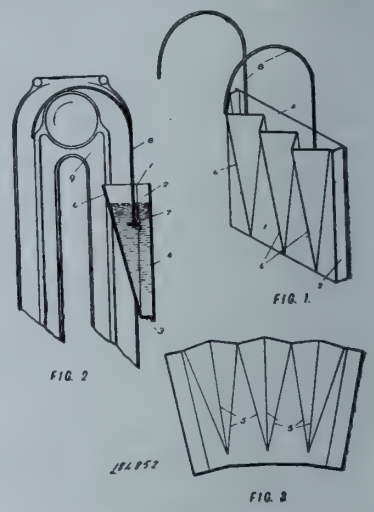
5. In a device of the class described, supporting means adapted to hook over the top of a radiator, a water pan connected with said supporting means and adapted to hang at the back of the radiator, and a strip of absorbent fabric



184,666. Radiator Mechanism.

dipping into said pan and provided at its upper edge with a crossbar suitably connected with the supporting means at the top, said supporting means being shaped to freely expose both sides of the fabric.

6. In a device of the class described, supporting means adapted to hook over the top of a radiator, a water pan connected with said supporting means and adapted to hang at the back of the radiator, and a strip of fabric dipping into said pan and extending up and over the supporting means at the top, the continuity of said fabric being broken at the top at a suitable point to prevent siphoning of the water taking place.



No. 184,852. Humidifier.

No. 184,852.

Charles Edward Ormsby, Toronto, Ontario, Canada, 11th June, 1918; 6 years. Filed 5th April, 1917. Receipt No. 278,015.

Claim.—1. A humidifier for radiators comprising a receptacle having a connected series of angular projecting pockets or recesses of diminishing magnitude throughout their depth, a wall of plain extent, and means for supporting said receptacle in contact with the radiator coils, for the purpose hereinbefore set forth.

2. A humidifier for radiators comprising a receptacle having an open top, a wall formed of a series of triangulated surfaces symmetrically arranged to form projecting portions of decreasing magnitude throughout the depth thereof and adapted to fit between the adjacent sections of said radiator, a wall of plain extent, and supporting arms freely attached to bridges within said receptacle and terminating in loops adapted to engage the radiator sections and support the said receptacle, for the purpose hereinbefore set forth.

No. 184,799.

Leo J. Buesse, Webster Groves, Missouri, U.S.A., 11th June, 1918; 6 years. Filed 2nd April, 1918. Receipt No. 292,997.

Claim.—A device of the class described comprising a flat base adapted to sup-

(Continued on page 29)

PRACTICAL SHEET-METAL WORK

THREE PIECE ELBOW WITH GUSSET OR GORE PIECE.

BY THOMAS STANSFIELD

THE question of roof drainage is one which requires some little study, and those interested in sheet metal work will no doubt from time to time be called upon to do such work. We showed in a previous issue how a hopper for a flat roof could be made, but it was more for a roof that drained to the centre.

Fig. 1 in this article shows a type of hopper which is used for draining rain water from a roof that is sloped to one side, and through separate rain water leaders of cast iron soil pipe. The top is nearly level with the roof and a wire screen or basket is made in hood form over the top so as to prevent leaves or any other material from getting into the pipe.

Fig. 2 shows the front view with back flange. A perspective view is also shown which gives the reader a better idea of what the hopper looks like.

Having determined the size required, draw a side and front view. Then divide the curved portion into equal parts as shown, as well as the straight side piece, 1, 2, 3, 4, 5, and 6. Then draw a stretchout line to which the measurements, 1, 2, 3, 4, 5, and 6, must be transferred. Now draw a number of vertical dotted lines from 2, 3, 4, 5, and 6 downward, and intersect these lines by drawing horizontal lines through same. A solid line drawn through these points of intersection completes the desired patterns.

It will be noted that if the side view and front view are drawn in line with each other, the vertical and horizontal dotted lines need only to be extended sufficiently long to draw the patterns for all the pieces, two for the sides, and one for the front, while the front view, Fig. 2, is the pattern for back.

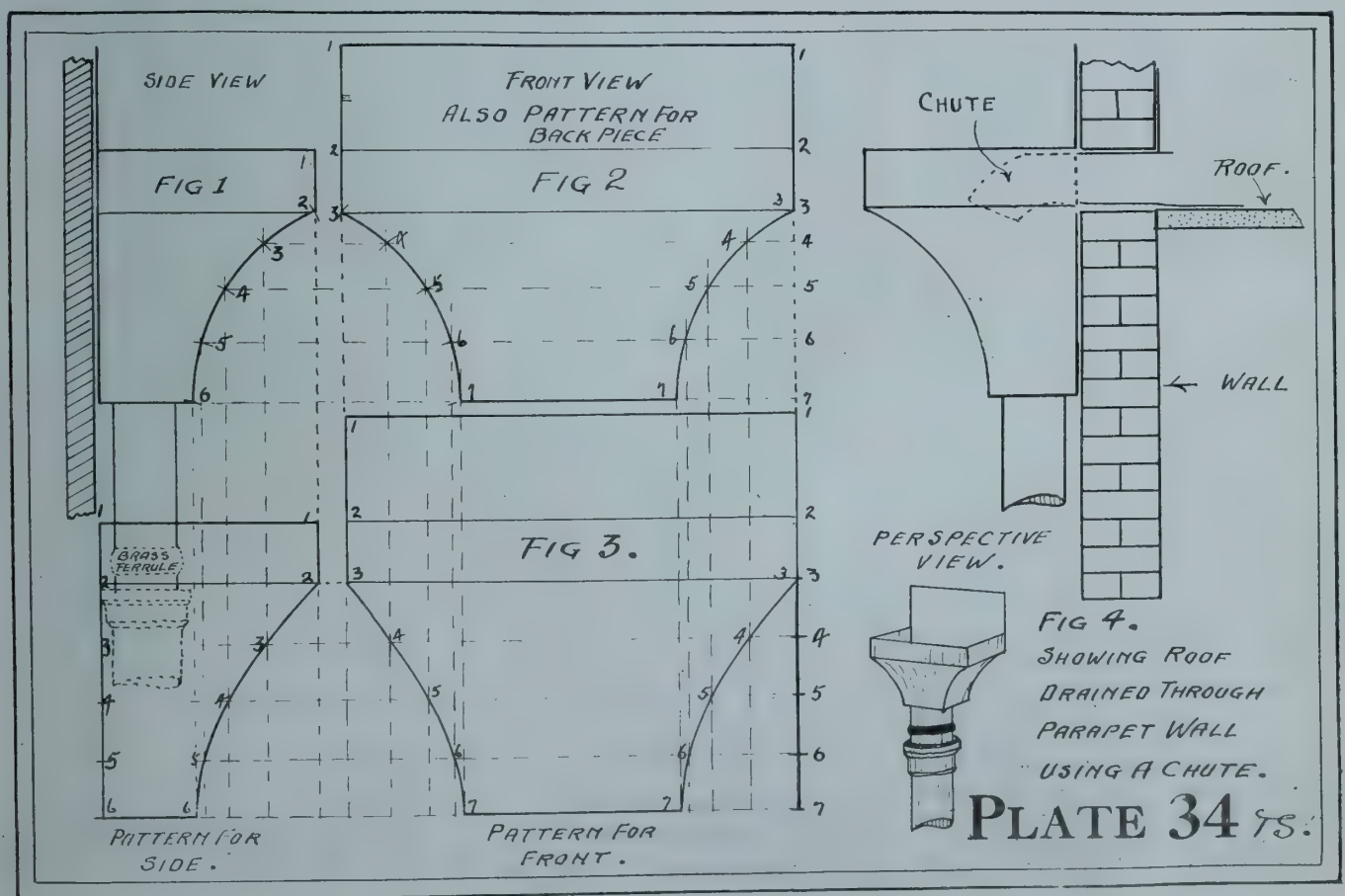
Sometimes the sides and front pieces are made all the same length as the back piece, thus allowing a flange piece to fit underneath the roofing material. So that by cutting the front as shown at 1, 2, 3, 4, 5, 6, and 7, sufficient material would be allowed for a flange. That is of course when such a hopper is used for the inside of the parapet wall.

Fig. 4 shows the same design of a hopper used on the outside of the parapet wall, the water being conveyed through the wall with a chute. This is simply a rectangular pipe with a short spout, the same shape and size as the chute..

When water is conveyed through a conductor pipe, as shown in Fig 4, it would be better to use a corrugated pipe.

Many persons are not aware of the reason why corrugated pipe is used, but it is very important that such pipe be

(Continued on page 32.)



Market Conditions and Tendencies

Statements Regarding the Prices and Trend of Supplies.

THE MARKETS AT A GLANCE

CHANGES in the price of some lines of enamelware have occurred since last issue, flat rim sinks and basins registering substantial advances. An advance of $2 each has been provided for in new price issued on closets.

A revision in the prices ruling on black steel sheets has been made. This provides for a decline of 50c per 100 pounds. This decline is not a result of better supplies on hand or in anticipation of any immediate improvement, but is the result of an effort to get away from any values which might even appear fictitious. The same may be said to be true of plates which have declined $2 per 100 pounds. Orders are being accepted at new schedule of prices for delivery as sheets or plates are available.

Galvanized sheets are steady, some sources reporting a decline of $1 per 100 pounds, and lower basis thus reached is now most generally in vogue.

Antimony, essentially a war metal, has been the first to really break. Prices are down 4c per pound, and it is possible that even lower levels will be reached. Tin has again taken a 5c drop in some quarters. Lead is very scarce as yet, and spelter has firmed up during the past few days.

TORONTO, November 28.—Higher prices have been named on some lines of enamelware, sinks, basins and closets reaching each higher levels. A new discount has been named on some lines of globe, angle and check valves, providing for an increase of about 10 per cent. Black sheets are down 50c per 100 pounds; tin is lower and antimony has recorded a sharp break of about 4c per pound. Business is considered very good, as a whole.

Steady Tone In Range Boilers

RANGE BOILERS.—The situation is without any material change as far as range boilers are concerned. It is hoped that supplies of sheets will soon be more plentiful so that a full range of sizes can be turned out. Prices are firm at following levels:

	Standard	Extra Heavy
30-gallon range boilers	$14.00	$17.00
35-gallon	17.00	20.50
40-gallon	20.50	24.00
52-gallon	28.00	32.00
66-gallon	37.00	42.00
82-gallon	45.00	50.00
100-gallon	62.00	70.00

Sinks, Basins, Closets Go Higher

ENAMELWARE.—New prices have been named on flat rim sinks which provide for advances over former levels. New quotations to the trade on the 16 x 24 inch are now $6.30 each net; 18 x 24 inch, $6.60; 18 x 30 inch, $6.90. Changes on basins are given as follows: No. 4335, $8.10 each, net; No. 4205, $11.50; No. 4045, $10; No. 4365, $7.20; No. 5145, $7.15. Closets have advanced $2 each, prices on the oak tank and seat now being $27, and white vitro tank $29. The undertone to the market is very firm and changes are in line with information given out in these columns for some time past.

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Basins, flat back, 14 x 15 in.	6 00
Do., corner, 15 in.	5 95
Sinks, roll rim, 18 x 30 in., staple	16 80
Closets, oak tank and seat	27 00
Do., enamel iron or white vitro tank	29 00

Soil Pipe Firm, Unchanged

SOIL PIPE, FITTINGS.—The market on soil pipe rules without change. Indications are that prices on pig iron will not be any lower for a long time to come and even higher figures are talked of. There is no indication yet of any easing away in the matter of supplies. The furnaces are pretty well sold up for the first half of 1919 and it will take some time before deliveries can assume nearly normal proportions. In the meantime most pressing requirements of the trade are being pretty well taken care of at discounts shown herewith.

SOIL PIPE AND FITTINGS

Medium and extra heavy soil pipe, 2 in. to 6 in.	15%
Medium and extra heavy fittings, 2 in. to 6 in.	25%
8in. soil pipe and fittings	Net list

C. I. PIPE FITTINGS.

Cast iron fittings	Net List
Plugs	15%
Bushings	18%
Flange unions, standard	Net List
Dart unions, ¼-inch to 2-inch	15%
Do., 2½ in. and larger	6½%
Nipples, up to 4-inch	45%
Do., 4½-inch and larger	40%
Do., running thread 4-in. and under	25%
Couplings, 4-in. and under	35%
Do., 4½ in. and larger	15%

MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittgs., Class A, lb.	.60	.75
Do., Class B., lb. net	.27	.37
Do., Class C., lb. net	.19	.27

Discount on Globe Valves Revised

VALVES.—A new discount has been named on globe, angle and check valves; standard, medium pressure, the former discount of 20 per cent. being superseded by one of 10 per cent. This is quite a substantial increase. No variation in other lines, other than that noted last issue has been made.

	Discount off list
Ground work	40
Compression work, standard	45
High grade	41
Cushion work	40
Fuller work, standard	43
High grade	36
Basin cocks, No. 0 standard	38
Nos. 1 and 2	38
Bath cocks	48
Flatway stop and waste cock, standard	45
High grade	45
Roundway stop and waste cocks, standard	45
High grade	45
Brass steam cocks, standard add 10%.	
Globe, angle and check valves, standard.	Net
Do., removable seat	Add 5%
Radiator valves, standard	10

	Net List
Do., removable seat	
Patent quick opening valves	30
Basin Cocks—	
No. 0 and 1, Fuller pattern	48
Globe, angle and check valves, standard, medium pressure	10
Radiator valves, standard med. pressure.	30
Radiator valves, removable seat, medium pressure	25

Waste Unchanged; Oakum Steady

WASTE, OAKUM.—The market remains firm and unchanged on cotton waste. Business is considered good. Oakum is holding steadily without change at following levels:

	Per 100 lbs.
Best American	$21 00-$22 00
Clipper, spun	-21 00
Do., unspun	-10 50
Plumbers', spun	10 00- 10 50

Wrought Pipe in Steady Market

WROUGHT PIPE.—The situation in wrought pipe shows no material change as yet. Some relief in the steel situation may develop, and as this becomes more pronounced supplies of pipe will show a corresponding improvement. Prices shown herewith are unchanged.

WROUGHT IRON.
Price List No. 37—September 11, 1918
Standard Buttweld

	Steel		Gen. Wrot. Iron	
	Per 100 feet			
	Blk.	Gal.	Blk.	Gal.
⅛ in.	$ 6 00	$ 8 00	$.....	$.....
¼ in.	5 22	7 35	5 52	7 65
⅜ in.	5 22	7 35	5 52	7 65
½ in.	6 63	8 20	7 06	8 71
¾ in.	8 40	10 52	8 97	11 09
1 in.	12 41	15 56	13 26	16 41
1¼ in.	16 79	21 05	17 94	22 20
1½ in.	20 08	25 16	21 45	26 54
2 in.	27 01	33 86	28 86	35 71
2½ in.	43 29	54 11	.....	.....
3 in.	56 51	70 76	.....	.....
3½ in.	71 76	88 78	.....	.....
4 in.	85 02	105 19	.....	.....

Standard Lapweld

	Steel		Gen. Wrot. Iron	
	Blk.	Gal.	Blk.	Gal.
2 in.	$ 31 82	$38 30	$33 70	$40 20
2 ½in.	47 97	58 21	50 90	61 10
3 in.	62 73	76 12	66 66	79 90
3½ in.	78 20	96 14	82 80	100 00
4 in.	92 65	114 00	98 10	119 00
4½ iu.	112 00	137 00	125 00	149 00
5 in.	130 00	159 00	145 00	174 00
6 in.	169 00	206 00	188 00	226 00
7 in.	219 00	268 00	243 00	292 00
8L in.	230 00	281 00	255 00	306 00
8 in.	265 00	324 00	294 00	353 00
9 in.	317 00	388 00	.....	.....
10 L in.	294 00	360 00	326 00	392 00
10 in.	379 00	464 00	420 00	505 00

Terms 2% 30 days, approved credit.
Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Boiler Tubes to Decline About 10%

BOILER TUBES.—Lower prices are being worked out on boiler tubes, which will provide for a decline of approximately 10 per cent. Figures are not yet available. This is not due to any improvement in the matter of supplies, in fact the situation in regard to stock is even worse, the market being bare of tubes. However, the feeling prevails that lower prices are in order, although indications are that it will take some months before stocks are back anywhere near a normal basis.

BOILER TUBES—	Cold Drawn	Lapweld
1 inch	$36 00	$.....
1¼ inch	40 00	.....
1½ inch	43 00	36 00
1¾ inch	43 00	36 00
2 inch	50 00	36 00
2¼ inch	53 00	38 50
2½ inch	55 00	42 00
3 inch	64 00	50 00
3¼ inch	.....	58 00
3½ inch	77 00	60 00
4 inch	90 00	75 00

Prices shown are under revision downward.

Black Sheets Down 50c; Plates $2

SHEETS, PLATES.—New prices have been established on black steel sheets in some quarters, which represent a decline amounting to 50c per 100 pounds. Supplies are still light in some gauges, but orders for delivery at a later date will be accepted on basis thus established. One Toronto warehouse is now quoting $8 on plate. That is a direct cut of 2 cents per pound, as $10 has been the prevailing price for a number of weeks now. This move was not due to any great improvement in the purchasing conditions, but rather was it the outcome of a desire on the part of the trade to get below the $10 price for plate, which it is indicated, has been more or less of a fictitious value for some time past. The outlook sems to be improving as far as securing supplies is concerned, and indications are that a fair movement will soon be in progress which will take care of the most pressing needs of the trade. Galvanized sheets are fairly steady, with prices ranging from $11 to $12 per 100 pounds for 10¾ oz., with the lower figure in more general use. Whether this basis will be maintained when supplies are freer is a question, but it seems possible that another $1 may be taken off the price in a few months, when stocks are more nearly their normal level. The demand for immediate requirements is considered fairly satisfactory.

BLACK SHEETS—	Per 100 lbs.
10 gauge	$....-$8 50-$10 00
12 gauge	8 35- 9 60- 10 00
12 gauge	7 90- 8 40- 8 90
16 gauge	8 00- 8 55- 8 85
18-20 gauge	7 80- 8 05- 8 80
22-24 gauge	7 85- 8 10- 8 85
26 gauge	7 90- 8 15- 8 90
28 gauge	8 00- 8 25- 9 00
3-16 inch plate	....- 8 40- ....
¼ inch boiler plate	....- 8 00- ....

Prices shown are for full cases. An extra charge of from 25c to $1 per 100 lbs. is made for less than case lots.

GALVANIZED SHEETS—		
10¾ oz.	$11 00	$12 00
U.S. 28	10 70	11 70
U.S. 26	10 40	11 40
22 and 24	10 25	11 25
18 and 20	10 10	11 10
16	9 95	10 95
14	9 85	10 85

Prices shown are for full cases. An extra charge of from 25c to $1 per 100 lbs. is made for less than case lots.

Lead Products Hold Without Change

ZINC AND LEAD PRODUCTS. — Manufactured lead products are held in a market that is steady and without change. Pig lead is still hard to procure for commercial purposes, and improvement in this regard may be rather slow. There is no indication of any immediate change in prices shown below. Solder is without any element of particular interest. Prices are well maintained, and it is thought possible that two months anyway must elapse before conditions will provide a basis for any change, if they do then.

Lead pipe, lb.	....	0 15
Lead waste pipe, lb.	....	0 16
Lead traps and bends	....	Net list
Lead wool, lb.	0 14	0 15
Lead sheets, 3 to 3½ lbs. sq. ft., lb.	0 14¼	0 15
Lead sheets, 4 to 8 lbs. sq. ft.	0 13½	0 14
Cut sheets, ¾c. lb. extra and cut sheets to size, 1c. lb. extra.		
Solder, guaranteed, lb.	0 50	0 55
Solder, strictly, lb.	0 47	0 52
Solder, commercial, lb.	0 42	0 45
Solder, wiping, lb.	0 40½	0 50
Solder, wire, lb.	0 56	0 70
Zinc sheets, per lb.	....	0 26

Market on Old Materials Featureless

OLD MATERIALS. — Conditions are unchanged, the market being featureless. Buying interest is lacking and trading is at a standstill. That a change may be made seems possible, and lower prices seem to be the most likely trend. In the meantime, nominal quotations are given as follows:

Dealers' Buying Prices		
Tea lead	$0 05¼	$....
Heavy lead pipe	....	0 08
Yellow brass	0 12	0 13
Red brass	....	0 21
Light brass	....	0 09½
Heavy zinc	0 05½	0 06
Heavy copper	0 22	0 23
Stove plate, per ton	....	25 00

Tin Easier; Antimony Breaks; Spelter Firm

INGOT METALS.—A lower basis on tin has generally been established. Spelter seems to have firmed up, supplies being offered being picked up quite quickly and it has developed now that stocks are none too plentiful. Antimony is down four cents per pound.

COPPER. — The situation is without any material change. There is very little being released for commercial purposes as yet, and as the fixed price stands until January 1 it is known definitely there is no need for shading the quotations on this metal. Locally the prices hold at around 30 to 32 cents per pound.

TIN.—A basis of 85c per pound generally has been established on tin. The range runs up to 90c, but the lower figures are most generally accepted. Supplies are considered ample for the demand, and there is comparatively little trading going on.

SPELTER. — Offerings which seemed to be quite liberal a few days ago have been snapped up quite quickly, and the market is none to free of supplies. This has had a tendency to stiffen the tone of the market somewhat, although no quotable change has been reported, 11c per pound being the figure generally prevailing.

LEAD.—There is no material change in the situation on lead. Supplies are still scarce and commercial interests are not obtaining allotments freely. This

Continued on page 29



VICTIM OF "FLU"

David Warwick, manager of Lord and Burnham Co., Ltd., St. Catherines plant, died November 19th, a victim of the "flu."

A "FLU" VICTIM IN SASKATOON

A correspondent to SANITARY ENGINEER writes us as follows in connection with the "passing on" of a member of the craft in Saskatoon:

"Yes, he was a splendid fellow, was Fred Halpenny. He was in the employ of the Northern Plumbing and Heating Co. He was a man of 33 years, always carried a cheery smile for everyone, hence it is no wonder that he was followed to the grave by every master and journeyman plumber, steamfitter, builder, architect and every other master craftsman in the building trade in the city of Saskatoon.

There were also, besides delegates from his lodges present, every firm represented that does business in this district in the metal trades.

It was a big funeral. The plumbing and water inspectors, both of whom have only recently recovered from severe attacks of the "Flu," were present.

SANITARY ENGINEER regrets to have to report the passing on of such a splendid fellow. But we know that when men of all classes respect such a person as Fred Halpenny, there can be no doubt but that our absent friend has "crossed the Bar" hearing that grand welcome, "Well done thou good and faithful servant."

MONTREAL CRAFT MEETS

The regular monthly meeting of the Master Plumbers' Association of Montreal and vicinity was held recently at the Drummond Building, President James Griffin presiding.

The secretary stated that he had written to the provincial secretary, asking that one of the seats on the board of directors of the Council of Arts and Manufactures should be given to a member of the association. A committee was named to interview the provincial secretary on the subject, if necessary, comprising Messrs. J. E. Walsh, P. C. Ogilvie, A. Charette and James Griffin.

J. E. Walsh reported that by arrangement with the deputy minister of labor, Ottawa, his committee had recently had an informal interview with T. Bertrand, fair wage officer, regarding the wages of plumbers and steamfitters in the district of Montreal on buildings being erected for the department of public works. He suggested that the secretary enquire whether Mr. Bertrand had reported to the department of labor, and with what result.

As the December meeting will be the annual one, the president named the following to select a slate for 1919 officials: J. E. Walsh, James Saunderson, George Delaney and Walter Ryan.

HANDED IN HIS CHECK

About two years ago a bright lad, only one of the many, volunteered his services to Canada and went overseas 20 months ago, when he was just turned 19 years of age. We refer to Sapper A. C. Rudow, of Elmira, Ontario. Like thousands of others, he left a good home, a son of good parents, leaving brothers and sisters at home, to fight the good fight for democracy, against autocratic militarism. He was wounded once, recovered, and later became a victim of influenza, which finally developed into pneumonia, and resulted in Sapper Rudow passing into the Great Beyond.

He learned the plumbing trade and, as a tradesman, showed that he would have had a promising career before him had he had the good fortune to return home.

SANITARY ENGINEER joins the many friends of the Rudow family in expressing our heartfelt sympathy for those whom Sapper Rudow left behind.

JUST PASSED ON

John J. Dooher, aged 45, for the past 22 years engaged in the plumbing business and for some time senior member of the plumbing concern of Dooher & Seager of Niagara Falls, N.Y., died on November 19, following illness of one week, of pneumonia at his home 415 Twelfth street, Niagara Falls. The late Mr. Dooher was born in Toronto, Ont., and was well known by quite a number of Toronto craftsmen, though since early childhood he had resided in United States. For several years he resided in Buffalo and more than score of years ago came to Niagara Falls, since which time he had engaged in the plumbing business. For many years the deceased had served as chairman of the municipal board in Niagara Falls. He also served several terms as alderman before the commission form of government was adopted at the Falls and at the time of his death he was custodian of voting machines in Niagara Falls. Deceased leaves three sons, Edmond, William and Irvin Dooher, and two daughters, Catherine and Helen Dooher, also a brother, Peter Dooher of Spartansburg, Pa., and a sister, Mrs. Winifred Hughson of Hamilton, Ontario. The late Mr. Dooher was member of Niagara Falls Council, No. 247, Knights of Columbus, Niagara Falls Lodge of Elks, 346, B. P. O. E., the Moose and the Orioles. Interment took place on November 22 at Niagara Falls, N. Y.

FOUR NEW BOOKS ON SANITARY HEATING AND VENTILATING ENGINEERING

It is very seldom that the trade are furnished with a set of books on plumbing and heating, etc., in as attractive a form as those just issued by the American Technical Society, Chicago.

The books contain hundreds of problems, and information on such subjects as:

Sanitary Science and Materials. Hydraulics. Sewers and Drains. Drainage and Venting. Sanitary Appliances. Sewage Disposal. Bacteriology and Sanitation. Infection Diseases. Steam and Hot Water Fitting. Domestic Hot Water Supply. Heating and Ventilating. Engineering. Sheet Metal Work. Business Management. Estimating. Contracts. Specifications. Mechanical Drawing. General Index and Review Questions and Index to each volume.

With these books goes free a year's consulting service in the American Technical Society. This enables the possessor to consult engineers and experts for one year without charge. They're just such questions that are within the scope of the book during a period of one year.

Full particulars can be procured by writing to the American Technical Society, Chicago, Ill.

NEW CATALOGUE

Modern Heating is the title of an exceptionally handsome catalogue just issued by the American Pressweld Radiator Corp. Detroit, Mich. The double-page spread in the centre of the catalogue shows the complete line of Pressweld radiators, which are made in sizes and styles to

fit every need. They are supplied in single, three and four-column types, all made of special radio alloy metal, of light weight, guaranteed efficiency in heating, easy to ship and to handle on the job. Attention is called to the fact that the new Eagle submarine chasers, now being built by the Ford Motor Co., Detroit, are equipped with Pressweld radiators on account of their lightness and economy of space. Sectional views of these radiators are accompanied by detailed descriptions of their features, and there are tables for each type that enable the steamfitter to quickly figure his requirements. Several pages contain photographs of high-class buildings in which these radiators have been installed and testimonial letters are reproduced from satisfied users. On page 23 are the results of tests made this year at the University of Michigan by Prof. J. E. Emswiler, which will be found particularly interesting on account of the high rate of efficiency developed by this type of radiator.

ON A VISIT TO OTTAWA

G. F. Frankland was a visitor at Ottawa last week in attendance at the three days' convention held by the Canadian Builders' Association.

A number of matters were taken up of interest to the sanitary and heating trade, particulars of which will appear in our next issue.

IMPORTANT APPOINTMENT

Major L. L. Anthes, general manager of the Anthes Foundry, Ltd., manufacturers of soil pipe and fittings, has been appointed along with Thos. A. Stevenson, of the Toronto Trade and Labor Council, to advise with Col. Healey, Deputy Minister of Soldiers' Civil Service Re-establishment, as to the replacement of soldiers in industry.

Major Anthes has, at a great sacrifice to his business interests, been serving on the permanent staff of Engineers, training men for overseas since the beginning of the war. He is a man among men, out to give a square deal to all and sundry. His services are more than ordinarily appreciated by Canadian business men, having held the position of chairman of Toronto branch of Canadian Manufacturers' Association for a number of years.

JIM GLENISTER PASSED ON

We regret very much to have to report the death of James Glenister, the late manager of the plumbing department of the Ashdown Hardware Co., Winnipeg. Mr. Glenister was a Toronto lad, learned his trade with Bennett & Wright. Later he travelled to Galt, Ontario, and became finally a partner in the firm of Scott & Bennett of that town, and on leaving sold out his interest.

For some time he represented the Dominion Radiator Co. in Western Ontario.



The late JAMES GLENISTER
Manager of the plumbing and heating department of the J. H. Ashown Hardware Co., Winnipeg, who died from influenza, on Wednesday.

The next move he made was when he joined the staff as Lethbridge representative for Metals, Ltd., and was manager there for a period of four years.

Some time during the early part of 1916 Mr. Glenister was appointed to the position he labored in at the time of his death, which we are informed was an attack of the "flu." It is too bad to have to lose such bright, promising, young fellows, but we can in this case remember our friend Glenister because of the good work he accomplished. Our sympathy goes out to those he has left behind.

MARKET REPORTS

(Continued from page 27.)

situation is expected to obtain for some little time. Quotations hold at around 10½ to 11 cents per pound.

ALUMINUM. — Commercial requirements are still held in abeyance. There does not seem to be any immediate opportunity of securing big supplies, and the market is expected to come back to more nearly normal conditons gradually. Quotations nominally may be said to range at 50c per pound.

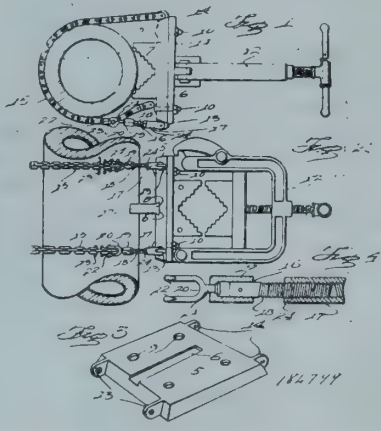
ANTIMONY.—A sharp decline of four cents per pound has been made in this metal. This brings the quotations down to 11 cents, and there is no indication that the bottom has yet been reached. However, it is expected that the prices will go down a little more easily than they have been doing from now on.

PIG IRON.—The situation in regard to iorn is really unchanged. The furnaces are pretty well sold up for the first half of next year, and this will have a tendency to stabilize the markets as well as prevent any possible glut of supplies. However, it is expected that it will be somewhat easier to secure pig iron and maintain production on a more nearly normal basis. In the meantime the situation is without any special features.

NEW PATENTS

(Continued from page 24)

port a pipe vise having its one face provided with an elongated dove-tailed groove, a pair of perforated ears formed



184,799. Vise Base for Columns.

integral on two sides and arranged opposite to each other, a detachable jaw having its base dove-tailed to correspond with the dove-tailed recess in the plate, said jaw having a V-shaped recess whose surface is provided with teeth and which is designed to contact with a post or pillar, a pair of clamping chains attached permanently to one pair of perforated ears, an adjusting hook attached to the opposite perforated ears, which hook is bifurcated and designed to grip the free ends of the chains, and means for adjusting the tension of the chain.

WINNIPEG PLUMBING DIVISION FOR MONTH OF OCTOBER

Permits Issued

93

Inspections

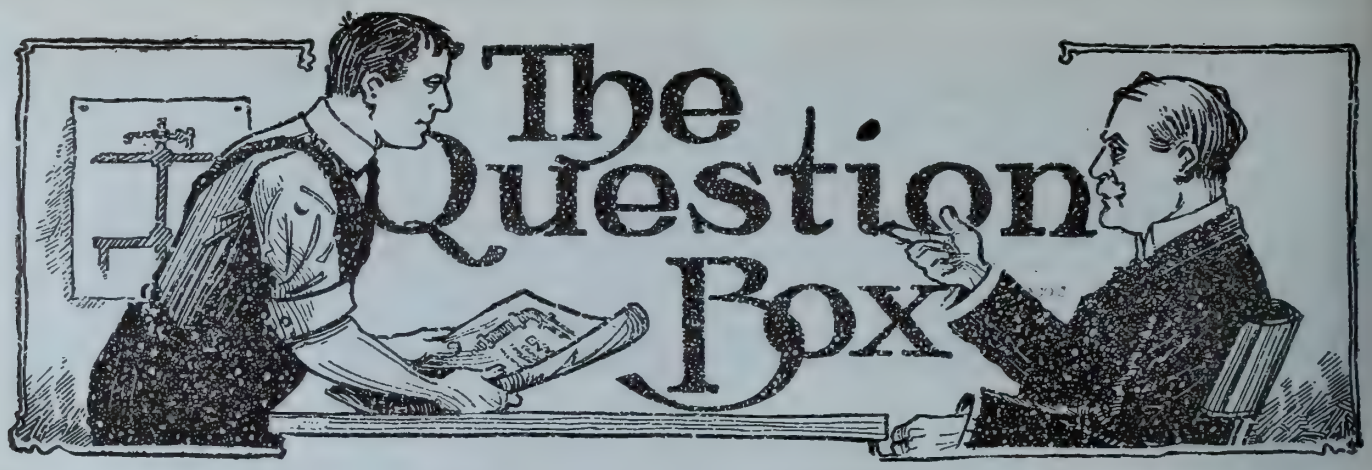
Water Tests	Smoke Tests	Subsequent Inspections	Miscellaneous Inspections	Defects Rectified
67	95	342	16	192

Sewer Division

Permits issued	Connections constructed	Inspections
10	21	60

Sewer Maintenance Division

Tank Flushings Gallons	Hose Flushings Gallons	Total Gallons of Water Used
993,024	772,500	1,765,524



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published--Description of Jobs Done or Shop Kinks Are Also Invited.

WHY NO HOT WATER NOW?

Editor Sanitary Engineer: I am sending you herewith sketch of a job I have installed. You may not quite understand it, however, but here is the situation:

In the first place I connected an 82-gallon boiler to a kitchen range; then I put a coil containing 15 feet of one inch brass pipe into the firebox of the hot water furnace and connected a 100-gallon boiler to a No. 10 tank heater. I then connected the other side of the heater to the coil and pipes leading to the kitchen boiler as shown above in the sketch. Before I hitched up the coil and jacket heater to the upper boiler I could get plenty of hot water, but now I can get none from the system even though the kitchen boiler is full of hot water unless I make a fire in the jacket heater and boiler. Will you kindly explain why I do not get hot water?

ONE FOR INFORMATION,
Nova Scotia.

In the first place this is a very unusual situation, and one that is not at all practical. There should be no need of a coil in the hot water furnace as there is nothing whatever gained by installing a coil in a furnace for water to be used for domestic purposes, because extra coal must be consumed and the cold water circulating through coil interferes with the combustion of gases.

As our inquirer has not given us any reason for installing two boilers, neither has he explained why a coil is installed in the hot water furnace and a jacket heater also installed. Therefore under these circumstances we are going to assume that first of all the 82-gallon boiler was installed and connected to the kitchen range water front, and, as a result of there not being a sufficient supply of hot water the coil in the furnace was brought into commission; then, still finding that there was not a sufficient quantity of hot water to draw from the jacket heater and 100-gallon boiler was installed. Now, assuming that our view of the situation is correct, we are submitting a suggestion in Fig. 2 that will, we believe, overcome the trouble, but at the same time we do not at all recommend such an installation.

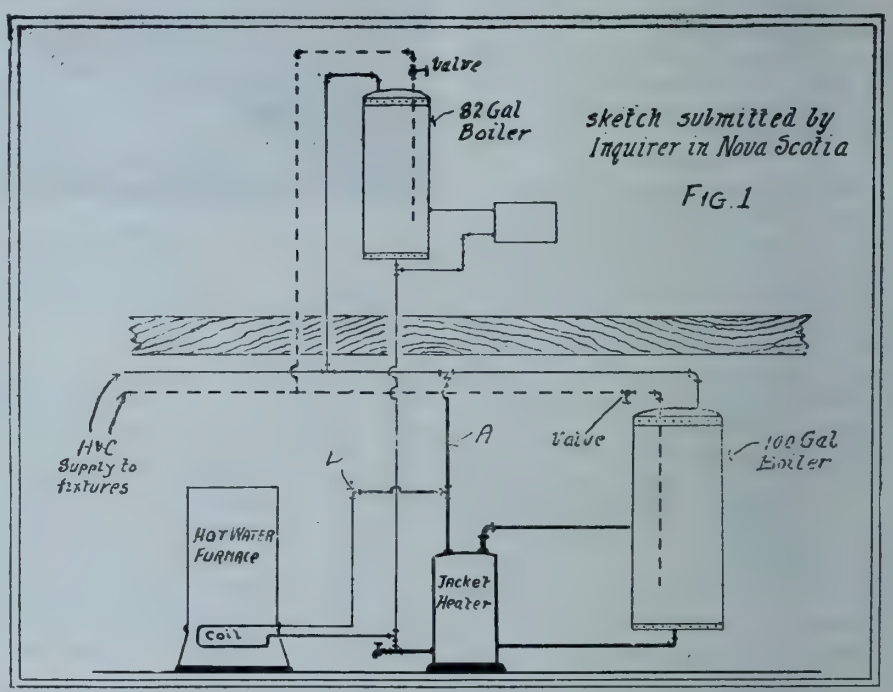
Our inquirer asks, "Why do we not now get hot water?" Here is the answer:

Seeing that the hot water supply is in a more direct line with the jacket heater and the 100-gallon boiler, when a faucet is opened the water flows from those two appliances, and, when the coil and jacket heater has a fire placed under them, even though there may not be as large a volume of hot water in them as there is in the kitchen boiler, the expansion of the water due to the heating creates a pressure that assists the hot and of course lighter volume of water in the upper boiler to flow through the hot water supply pipe.

Now, as we have said before, we are only suggesting a simple change, which may work O.K., and for this reason we are showing in Fig. 3 what we would recommend in preference to either plans shown in Figs. 1 and 2. We will, however, explain our reason for the suggested change as a possible cure. In the first place no tank heater should be in direct line with a hot water supply pipe as is the case shown in Fig. 1. It is merely an appliance to be used to heat water in a storage tank, either the 82 or 100-gallon tanks in this case. That is, under no condition should pipe A from the jacket heater be used. Neither should pipe B be connected to the hot water supply pipe (see Fig. 1), it is simply a heating pipe and should be also connected only to a storage tank.

Now, turn to Fig. 2. It will be noted that we have dispensed with pipe A and have run pipe B to the nearest side of the top connection on the kitchen boiler; this will establish a direct circulation between the coil in the furnace and the upper boiler. Furthermore, suppose that the coil in the furnace is the only source of heating the water it will be seen that as the top pipe of the coil is connected to the top of the upper boiler, the bottom pipe of coil is connected to the bottom of the upper boiler; this pipe is also shown connected to the bottom pipe going to the 100-gallon boiler by being run behind the jacket heater.

If our reader will trace the flow from the top pipe of the coil up through the T to the left and down the pipe to the top of the 100-gallon boiler, then down





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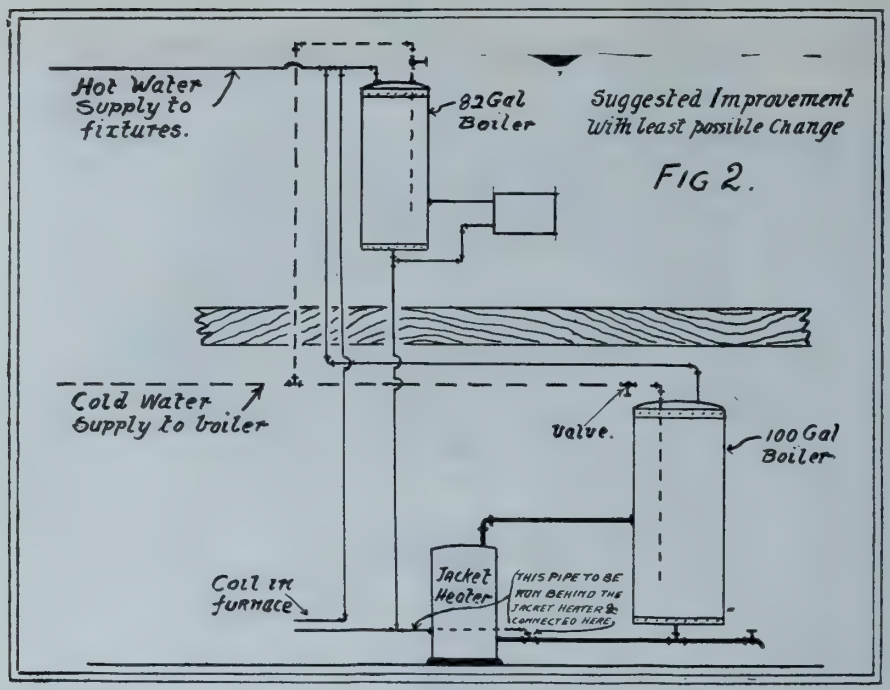


FIG 2.

through this boiler to the bottom pipe and along to the T, and continue around the back of the tank heater to the bottom of the coil, it will be shown how the coil can be made to heat water in both boilers. The same results can be procured when the tank heater is in operation, and at the same time there is no interference with the kitchen range connection to the 82-gallon boiler.—Editor.

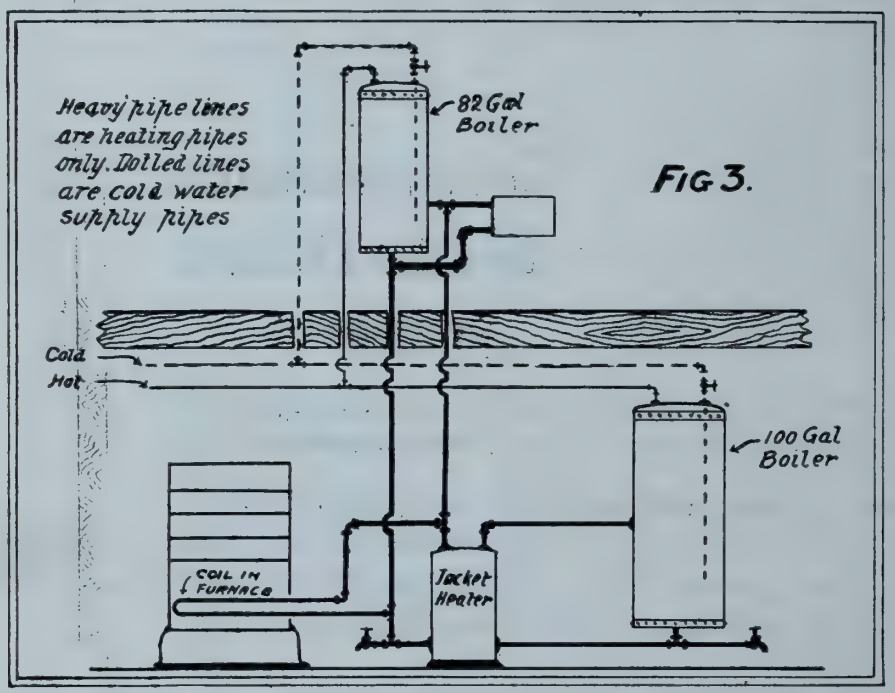


FIG 3.

PRACTICAL SHEET METAL WORK

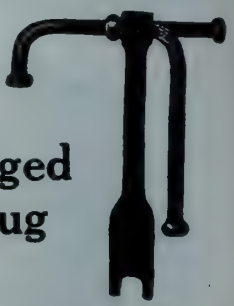
(Continued from page 25.)

used where there is any danger of the water or moisture freezing. The corrugations are necessary so as to take care of expansion by freezing and will prevent breaking or cracking.

Another matter, too, is that of making flexible offsets where one end or part is rigid and no provision is made for endwise expansion and contraction, such as, for instance, is shown in Fig. 4. It would be well to make the connection with a piece of lead pipe; that is, if an offset is used close to the hopper.

(Continued in next issue).

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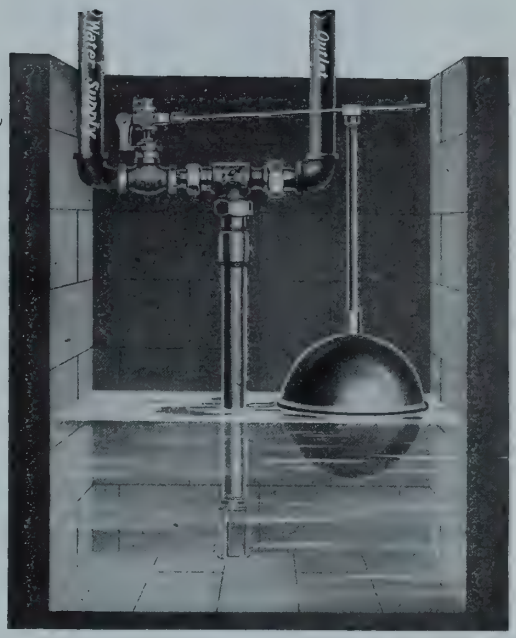
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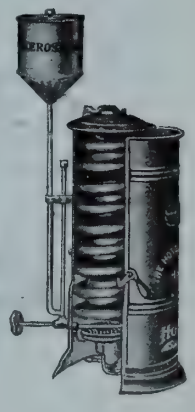
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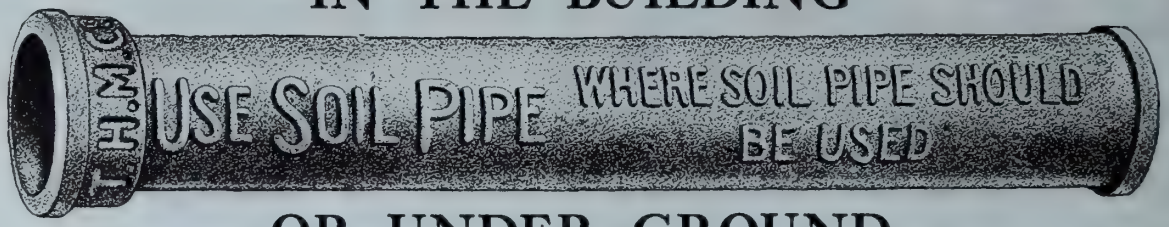
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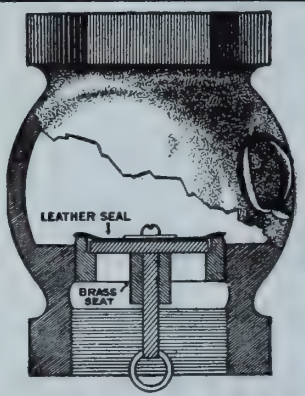


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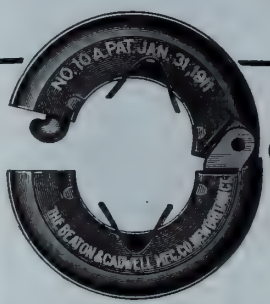
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United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.
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First Cost *versus* Upkeep Cost!

The purchase price means nothing if the upkeep cost is not low.

The purchase price of King Boilers is no more than the average boiler and yet—

The consumption of fuel—*the upkeep cost* is lower—considerably lower.



The thin, peculiarly shaped waterways in the "King" mean quickly heated water and perfect circulation, which causes a saving in fuel because it obviates the necessity of "extra firing" to move cold water from the radiators.

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All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES

Black and Galvanized
All Sizes

Ask your jobber for CT **Brand**

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Montreal Works: Lachine, Can.

PIPE AND THE PUBLIC WELFARE

By R. C. McWANE

A Book Just Off the Press

Every sanitary engineer should be the possessor of this book. It deals with pipe-making of all kinds, cast iron, wrought iron, steel, wood and tile pipe. It is valuable because it gives the users of pipe a true idea of how pipe lasts under various conditions when in service.

Price $1.00 Postpaid

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Over 50,000 Daisy Hot Water Boilers Now in Use—Are *You* Selling Your Share?



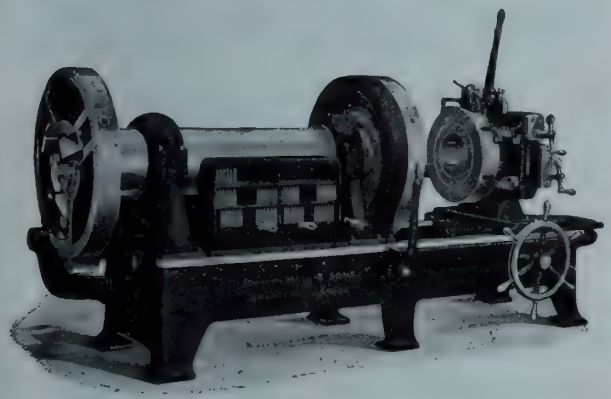
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BRANCH OFFICE: 136 SIMCOE ST., TORONTO

Pipe Machines of Merit



THE HALL No. 8

Duplex Improved Gear Box Driven. Capacity 2½ in. to 8 in. inclusive.

Note the drive belt at rear out of operator's way. Elevated die cabinet, control lever and speed levers all convenient to operator's right hand. Sliding die head.

These machines are equipped with a friction clutch, enabling operator to revolve pipe a few inches, if necessary.

Pipe Machines ranging from ⅛ to 18″.
Nipple Machines ranging from ⅛ to 4″.
Roller Pipe Cutters ranging from ⅛ to 4″.

Delivery from stock.

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TRIMO PIPE WRENCH



Two new features have been recently added to the Trimo Pipe Wrench, namely Nut-Guards, in all sizes, and unbreakable steel frames, in leading sizes.

The Nut-Guards prevent the accidental rotation of the nut while in use.

These improvements add 25% to the usefulness of the tool.

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All Trimo Pipe Wrench parts are interchangeable.

The inserted jaw in the handle can be readily replaced when worn, thus adding to the life of the tool.



Nut with Nut-Guards

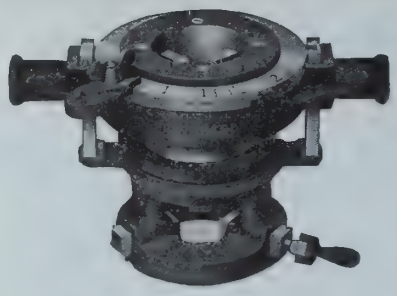


Inquiries from Importers and Dealers Solicited. Send for Catalogue No. 55.

TRIMONT MANUFACTURING CO.

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PIPE THREADING AND CUTTING TOOLS

One Man Can Thread up to 12 Inch.

You cannot afford to expect your men to make horses of themselves. If they did they could not keep it up. Our tools save time, do better work and make life worth living for your men.



Cuts Without Burring

No. 1 cuts from ⅛″ to 1″
No. 5 cuts from ½″ to 2″
No. 10 cuts from 2½″ to 4″
No. 15 cuts from 4″ to 6″

Ratchet	Geared
No. 6—¼″ to ¾″.	No. 41—2½″ to 4″.
No. 25—1″ to 2″.	No. 61—2½″ to 6″.
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TORONTO, CANADA

No. 1 B. & C. Automatic Radiator Air Valve

Made from the best brass with cast brass base. Screwed and soldered on, and equipped with high grade carbon. All valves tested before shipping. Use these together with our famous "B & C" Floor and Ceiling Plates and insure satisfaction.



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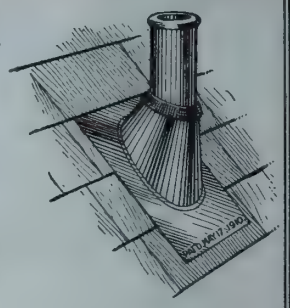
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Stocks carried by our Canadian Representatives

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The SIMPLEX Adjustable Roof Flange

Fits any roof from ½ pitch to flat—just slide it down the pipe and it will conform with the pitch of the roof.



Trade Price 2″ $1.00 4″ $1.15

Made in all sizes—For sale by nearly every jobber

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Second-Hand Pipe

1-2″ to 4″

Black and Galvanized

Send us list of your requirements

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14 St. John Street MONTREAL
Works: LACHINE, QUE.

"HAUSE" PIPE JOINT CEMENT

For steam, water, air, oil, gas, gaskets, etc. The cement that cements. Sets like gum. Allows no leaks.

The Great Value of "HAUSE PIPE JOINT CEMENT" lies in its peculiar chemical properties which permits of its hardening and expanding after the joints are made up. In making up joints it has the same effect as a lubricant on the best graphite, and while the joints may be made and broken readily, a perfectly tight joint is maintained at all times. Comes in 1-lb., 5-lb., 15-lb., 25-lb., 50-lb. cans, 100-lb. barrels. Manufactured in ready mixed and powder form. Ask your jobber for prices, or write us direct.



Manufactured in Ready Mixed and Powder Form.

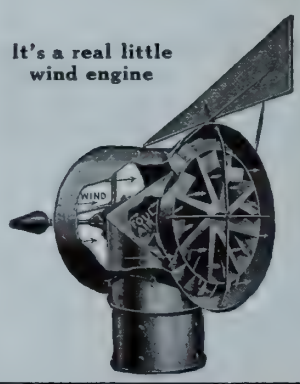
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Is a positive suction fan that ventilates

The "Bicalky" will dispense with all auxiliary heaters on local ventilation systems.

It is, as far as we know, the most scientifically constructed, self-propelled fan ventilator on the market.

Write us for full particulars.

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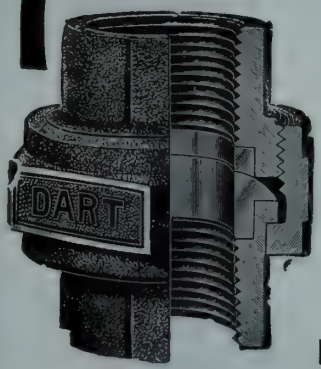
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Dart Unions

Will Make Your Good Work Last

They will not loosen up and leak and cause complaints from your customers.

THEY STAY TIGHT—PERMANENTLY—BECAUSE



Both Faces of the Joint are BRONZE

A metal that will not rust or corrode—and the **extra heavy iron parts** will not stretch or pull apart.

Fig. 1

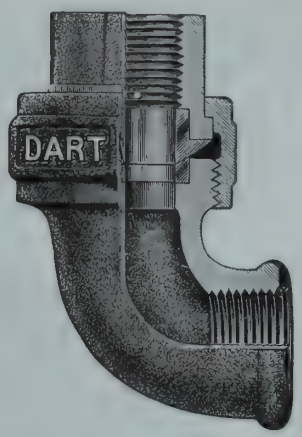


Figure 1 shows a combination that saves you two threads.

Fig. 2

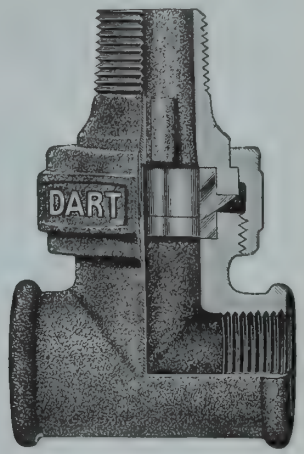


Figure 2 shows a combination of T, Union and Nipple.

Dart Union Combinations that Save Threads, Labor and Fittings

With Dart Unions you can make connections easily and quickly whether pipes are in or out of alignment.

SOLD BY ALL JOBBERS

Manufactured and Guaranteed by

DART UNION COMPANY, LIMITED

TORONTO, CANADA

KERR GATE VALVES



I. B. GATE

These Iron Body Gate Valves were designed and are made by US to meet YOUR demand for strong, substantial, interchangeable valves, with a "nobby" appearance.

They meet the requirement and more. When they get us a customer they hold him.

Who in the Steamfitting trade has not heard of and used Kerr's (Weber) Brass Gate Valves? We say "Kerr's"—not the imitations. We make this valve of uniform material, and they stand up to the work given them, just as they always have. Some have tried others, but they came back to the tried and trusty old "Weber Gate" made by Kerr. What is a few cents on a valve, when you can get one like the genuine "Weber"?

Have you our Catalogue No. 5?
If not, we will mail you one.
A postal to-day will bring it.



BRASS GATE

THE KERR ENGINE COMPANY, LIMITED

WALKERVILLE, ONTARIO

THE COUNTRY NEEDS COPPER

WHY WASTE IT IN W.C. TANKS

A TANK WITHOUT A LINING

EVERY FITTING TESTED



A TANK WITHOUT A FAULT

EVERY TANK GUARANTEED

OVER A QUARTER OF A MILLION NOW IN USE

And not a complaint to our knowledge. That is because we operate a plant that is equipped to make VitrO Tanks exclusively.

No joints of any description—an all one-piece tank—the tank with the trouble left out. That's why it is called the NO-TROUBLE Tank.

Galt Brass Company, Ltd.

Galt, Canada

SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

Vol. XII. Publication Office, December 16th, 1918 No. 24



Xmas Greetings To You

1918

That every plumber, sanitary and heating engineer in Canada may have a real old-time Merry Christmas and a Happy and Prosperous New Year is the sincere wish of

Empire Manufacturing Company, Limited

LONDON TORONTO

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While



A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for BEAVER BRAND CAST IRON ENAMEL WARE

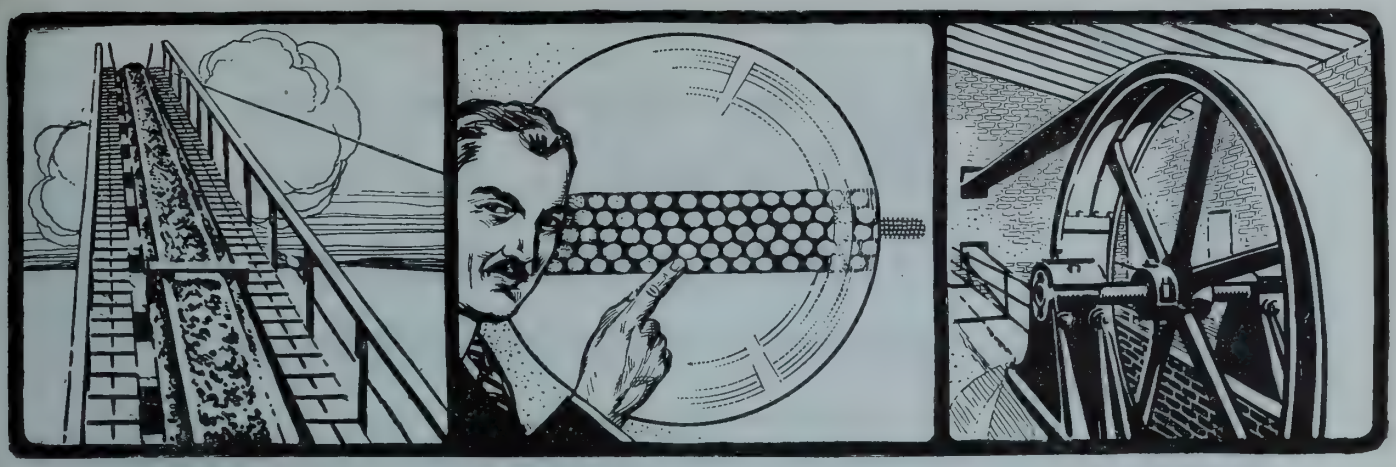
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Dominion Rubber System Belts are built to a scientific quality standard which insures the proper width, thickness and type of construction to efficiently serve a given purpose.

Dominion Rubber Systems Belts are *one-piece belts*—with absolute uniformity, dependability, economy and satisfaction built into each foot.

The layers of strong endless fabric are saturated and embedded in special rubber which gives a toughness that is practically indestructible.

Its rubber surfacing has a tested pulley grip greater than that of any other belt made, hence it allows minimum power leakage.

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If your belting problems need emergency service, phone or wire our nearest branch.

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Rubber System
Manufacturers of
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Dominion Tires, the Good Tires for every purpose.

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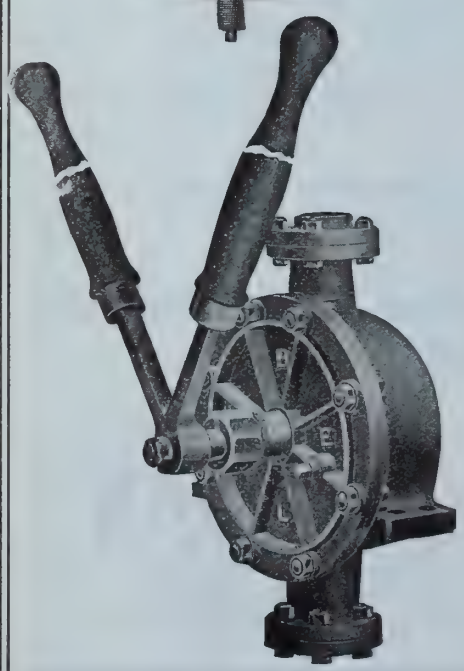
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DOMINION RUBBER SYSTEM
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Steam, Water and Compressed Air Fittings generally.
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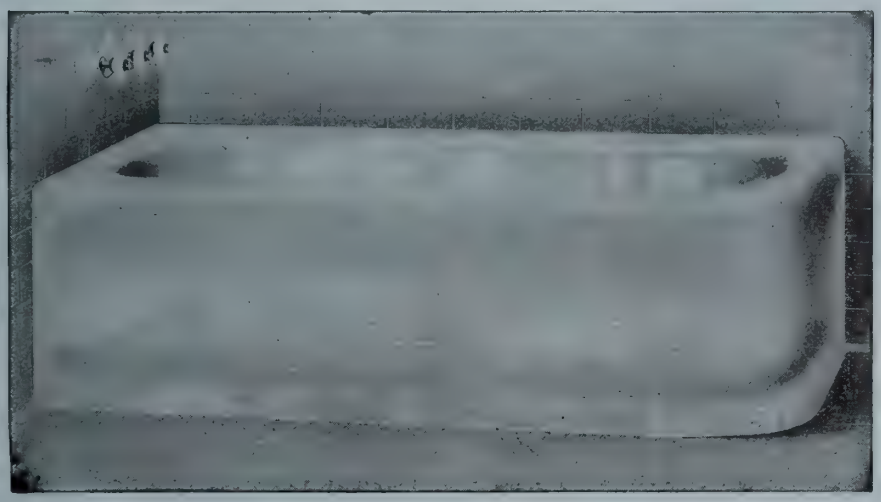
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EMPRESS FOUNDRY

Cornbrook, Manchester, England

"Standard"
"Perfection" Built-In Baths

Made in One Piece Enamelled All Over



These Baths represent the last word in design and finish, and are made to build into Right or Left Hand Corner or into a Recess.

The "Perfection" Built-in Bath is only 17½ inches high, therefore convenient. It builds into walls and floors, the absence of all dust-collecting cracks and corners, meaning bathroom sanitation.

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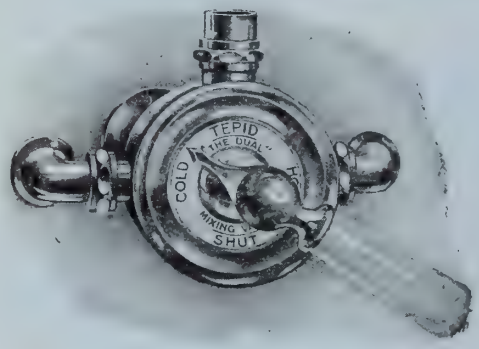
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"MADE IN CANADA"

G. & W. G. GUMMER, LIMITED

EFFINGHAM BRASS WORKS, ROTHERHAM, ENGLAND

And at
9 Fenchurch St.,
London





"Dual" Mixer

A valve that really mixes Hot and Cold Water, and maintains a uniform mixture.

For ease of operation, simple construction and easy installation, it has set a new standard of efficiency.

Cold Water must be turned on first, no possibility of scalding.

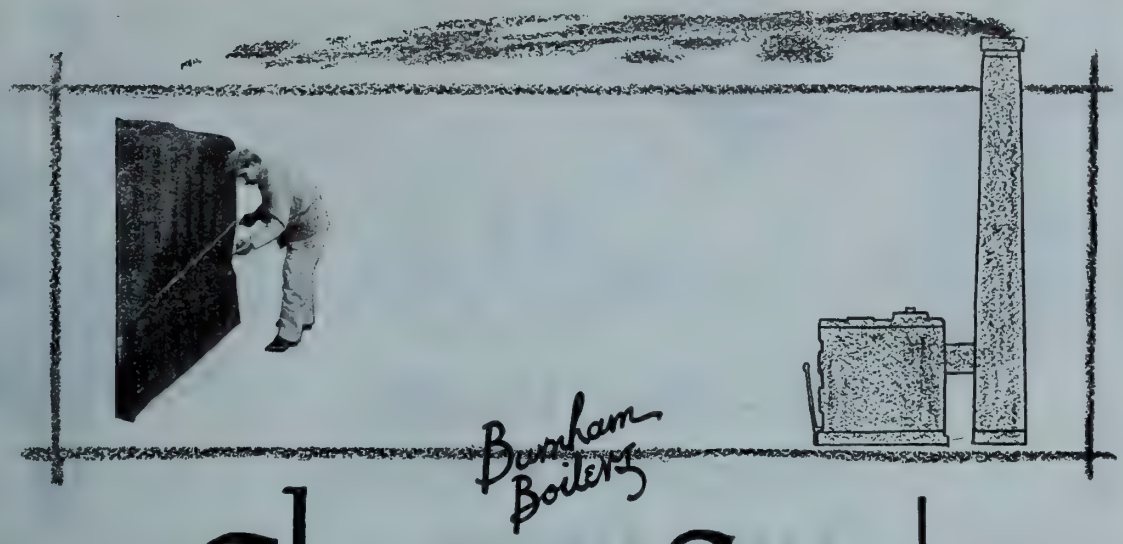
Made in several forms for Showers, Sprays, Operating Rooms, etc.

At the well-known works of Messrs. Brunner, Mond & Co. these valves provide baths for 2,500 employees.

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Manufacturers of every description of

Engineers,' Plumbers' and Sanitary Quality Brassware



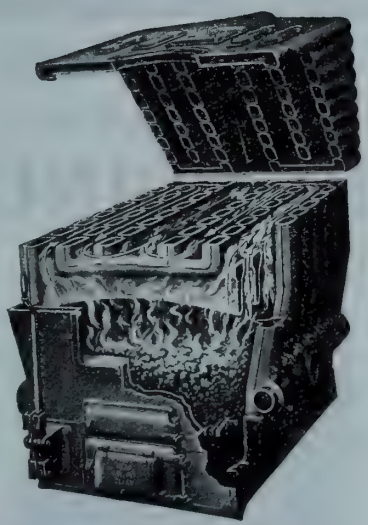
Chimney Scoots
How to prevent them

THERE is no philanthropy in attempting to heat all outdoors by way of your chimney.

Boilers are popularly supposed to be sieves that separate the heat from the coal.

Logically, then, the finer that sieve—up to a certain clogging point—the more heat.

Most boilers have either one or two openings at the back, between the combustion chamber and the flues. The natural tendency of the gases in the combustion chamber is to be drawn towards these openings, as shown by chalk mark on boiler above. This results in a decreased efficiency in the front surfaces of the combustion chamber.



This lifting the lid shows the passage of gases from the lower to the upper storey, and the three times back-and-forth fire travel, between water-filled flues.

With the Burnham, there is a flue *between each section,* on *each side.* Each section is equally heated.

These side flues lead from the lower to the upper story, where the three times back-and-forth fire travel begins.

This fire travel is the fine sieve. So thoroughly does it sift out the heat, that the average smoke-pipe is seldom too hot to hold your hand on.



Lord & Burnham Co. Limited of Canada
(Boiler Department)
ROYAL BANK BUILDING, TORONTO
Factory: St. Catharines, Ontario



The Completed Imperial Water Heater





Sectional View Showing Water Flow

We Put Good Money Within Your Grasp

when we put the Imperial Gas Water Heaters on the market.
They are undoubtedly the most economical on gas of any other make. They are not only easy on gas, but with the perfect circulation they

"HEAT WATER IN A JIFFY"

GOODWIN & COMPANY, Limited

Sarnia, Ontario, Canada

WE SPECIALIZE IN

PIPE THREADING TOOLS

Take Another Look At This Job

ESTABLISH PEACE

If you desire to establish lasting peace in your shop, you will have to furnish your men with good tools. Men will not do the same amount of work if that work is hard. The more you *INVEST* in tools if they're good tools, the less you will SPEND in labor. To invest is to establish an asset, to spend is to create a liability. Our tools will save you money and make peace in your shop.



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Work made easy becomes a pleasure. Jardine and Toledo Pipe Threading Tools make threading pipe so easy that a boy can thread a 4-inch pipe as easy as he can thread a ½-inch pipe.

Not only so but when a thread is made with one of our tools it's a good thread. No cutting off pieces of pipe. No lost time and no leaks. That's the way to establish a profit on every job.

A. B. JARDINE & COMPANY, LIMITED, HESPELER, ONT.

Sole makers of "Jardine" Pipe-Threading Tools.
Sole licensees to manufacture and sell Toledo Pipe-Threading Tools in Canada.
Agents, Winnipeg and West—Stanley Brock, Ltd., Winnipeg, Man.

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JUST A PLAIN, ANNUAL, SEASONABLE WISH

"A Merry Christmas To All"

AND a genuine hope for a Bright and Prosperous Year to follow. Bright, because of the war cloud that has vanished. Prosperous, because of the opportunities that DO exist. It is our duty and yours to develop possibilities of 1919. Let us begin January 2nd, opening the year with a smile of optimism, carrying the brand of courage our soldiers have found so effective, and a determination to assist the reconstruction period, on a quality basis.

Our Motto for the future will be as in the past,
"Quality, Efficiency and Service."

THE CANADIAN BRASS CO., LIMITED

GALT :: :: TORONTO

Success and Your Associates

ALWAYS associate with men who are earning more money than you are. Such is the advice given by a man whose name is known the world over for his own success and the business which he created. It is good advice of a certainty, but we are not urging that it is the best advice. At the same time it is wise to associate with better or bigger men than you are yourself, because you are likely to be lifted up to their levels.

Most of us would probably like to be the intimates of J. P. Morgan, or of John D, or of Charlie Schwab, or Canny Andrew. If we had a speaking acquaintance with John Wanamaker, or Lord Beaverbrook, or Lord Shaughnessy, and with other distinguished and successful men, we would take comfort from the fact.

And most of us would feel rather small and uncomfortable if we were placed beside President Woodrow Wilson at a dinner table, or beside Sir Robert Borden, Sir Herbert Holt or Sir Wm. Mackenzie. And the reason would probably be that we know so little of the knowledge that really counts. If these successful business men engaged us in conversation we would probably find ourselves knowing very little about the things that matter.

This will illustrate the point:

Here's a true story. A Toronto manufacturer found himself on a train going to Albany in company with a number of distinguished Americans about to attend the inaugural ceremonies of a State Governor. A washout led to a delay, and the Canadian was thrown into close association with senators and congressmen and prominent lawyers. They bantered the little Canadian about Canada. He had the pluck of a bigger man. He had been a constant reader of THE FINANCIAL POST, and had absorbed many facts about Canada. He surprised his American traveling companions with his positive, well-informed and wide knowledge of Canada. When the company reached Albany, the Canadian was persuaded to attend the ceremonies, and was introduced as the man who knew all about Canada. The Governor was interested in Canada, and said so, and the little Canadian found himself telling the story of Canada very ardently to a very attentive listener, much to the amusement of his friends who introduced him.

This man made a hit on that journey, and many friends. One of the company gave him a stock market tip worth a fortune.

The point of this story is: You, as a Canadian, can make yourself informed very fully and intelligently if you become a regular reader of THE FINANCIAL POST. You can make yourself a worthy companion and intimate of presidents and magnates. The world likes to listen to men who know something well, and who can talk interestingly and informingly on the subject of their study.

You can become worth listening to if you know your Canada well. And you can get the kind and amount of knowledge concerning Canada which will make you interesting to others if you will read THE FINANCIAL POST regularly each week.

IF you read THE FINANCIAL POST REGULARLY you will find yourself keeping company with the highest paid staff of editors engaged on any publication in Canada—trained men who know how to make others know what they know and learn.

You will find yourself living in a most interesting world—the great, throbbing world of business. You will have your thoughts tremendously stimulated and helpfully directed. You will find yourself becoming a fit table companion for big men — this because you will have knowledge of a quality that will keep you from shame.

What is it that keeps you and THE POST separated? It cannot be its subscription price of $3. Probably it is because you are not very well acquainted with this paper.

We are going to put it to you this way: If you have the desire to be worthy of association with big men, then prepare yourself for such association by reading THE POST, and to make acquaintance easy, we provide the coupon below. It offers you THE POST for four months for a dollar bill.

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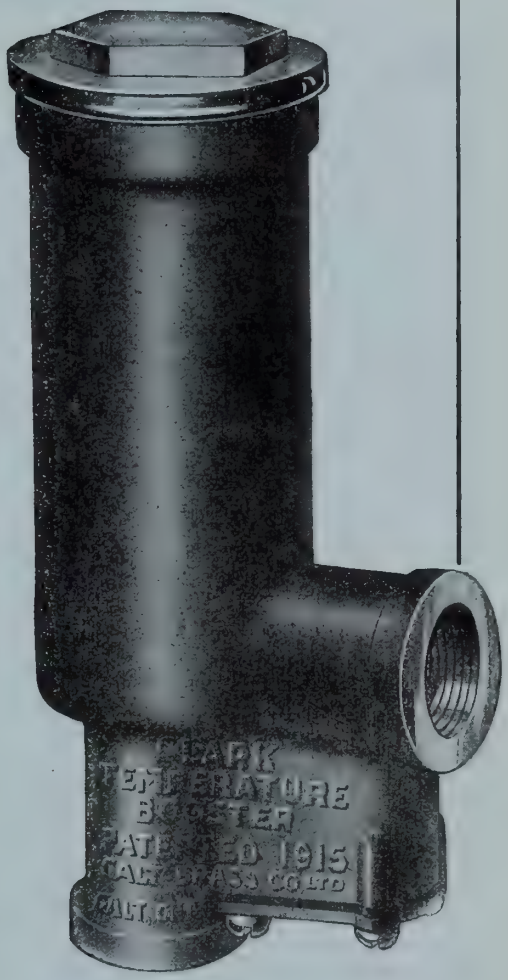
Clark Temperature Boosters

Actually Save Piping and Fittings!

To be able to cut down the size of piping and fittings these days will help you considerably in the way of extra profits on work done! Or to look at it from an entirely different point of view, you are actually losing money if you do not fit a Clark Temperature Booster on every job.

You conserve material and also assist in saving coal, to the extent of 15 per cent.

Here's an example. A house requiring 10 tons of coal to heat it during a winter season will only burn 8½ tons and procure greater comfort from the fuel burned.



Write Us or Write Your Jobber

GALT BRASS CO., LIMITED

GALT, CANADA

SANITARY ENGINEER

VOL. XII. DECEMBER 16, 1918 No. 24

Fuel Must Be Conserved

One of the Biggest Problems to be Solved in the Dominion—Each Should Do His Part —A Question Where Co-operation is Imperative

WHEN we consider how very necessary it is to those people who live in cold climates that they should be kept warm, when we consider that in those cold regions coal is not one of the minerals that can be procured on the spot, we must conclude that it is a big problem to see that coal is supplied to all in sufficient quantities, particularly when such coal must be transported from mines situated at great distances from the consumer.

There has, however, been no real practical scheme adopted in Canada that will for all time result in the conservation of fuel. This can only be done when some practical heating by-laws are put into force, a by-law in the shape of a federal ordinance.

Heating engineers know quite well how at least 25 per cent. of the fuel brought into the country, dumped into coal bins, or stored, can be conserved. They know that very few heating systems are as economical on fuel as the common pot stove. They also know that heating systems properly installed, complete with all the fuel saving devices that can be procured, are exceptions rather than the rule.

First of all let us take the warm air furnace, the worst dust maker on earth and, therefore, the most unsanitary of them all. Yet, in all fairness to the warm air furnace, it must be admitted that the way they are installed is more at fault than the furnace itself.

Very few are fitted with a properly designed double casing, and no attempt is made to have such furnaces under automatic control. This, however, may be said of almost every heating system.

Next comes the steam furnace. It is only within the last few years that any attention has been paid to covering these furnaces and piping, and no law exists that requires these furnaces to be properly inspected periodically. Neither is there any hard and fast rule that would require a proper size of furnace to be installed to heat a given size of a building.

The same with hot water heating systems. Thousand of houses have been erected for speculation by bulk and speculative contractors and have been sold as being a high grade house—"hot water heating"—when as a matter of fact the system has been found to be quite inadequate to properly heat the building. No attempt, of course, at furnishing any heat-controlling devices.

FORM "A"

REPORT

TO

THE FUEL ADMINISTRATOR

FOR THE PROVINCE OF ONTARIO

Municipality

Name of building.

(a) For what purpose is building used?

(b) If business, state what kind.

For what purpose is fuel used?

(a) Heating.

(b) Power.

State whether Steam, Hot Water, Warm Air, or Stoves Used.

Tons of Coal used per year.	1916-1917	1917-1918
Kind of Coal used in the past.	1916-1917	1917-1918

Quantity and Kind of Coal on hand. TONS	ANTHRACITE						BITUMINOUS
	Grate	Egg	Stove	Nut	Pea	Buckwheat	

Is any Wood or Gas used?

If Soft Coal used is same satisfactory?

Maker's Name of Boilers or Furnace, with Maker's Number or Size.

If Tubular Steel Boiler give Diameter and Length

How Many Boilers or Furnaces in Building?

Is Exhaust Steam used?

Can a Saving be Effected? Specify how much and in what manner.

REMARKS

Signature Date

Fuel Commissioner Date Received

To be made out in duplicate and returned to Local Fuel Commissioner. One copy to be retained by the Fuel Commissioner. One copy to be forwarded to Fuel Administrator for the Province of Ontario by the Fuel Commissioner.

We admit that this is a big job. But if the work was put into the hands of practical heating engineers, all difficulties would soon be overcome.

Take, for example, the work being done by the Dominion Fuel Controller, under whose jurisdiction are all the provincial Fuel Administrators. Forms have been sent out to all large consumers of fuel asking these consumers for certain information, and certain decisions are arrived at by experts who examine these forms when returned duly filled in. See fac-simile of these forms A and B accompanying this article.

The following communications have been sent out from the office of the Ontario Provincial Fuel Administrator to all local fuel commissioners under date of November 22nd:—

Gentlemen,—The following Order-in-Council has been issued by the Dominion Government:—

"Whenever deemed desirable by the Fuel Administrator he may, by registered letter addressed to the Fuel Commissioner, or if no such official is available, to the mayor of any town or city within his province prohibit entirely or limit in any manner specified the use of anthracite coal of what is commonly known as prepared sizes in any building whatsoever within such town or city other than private residences using less than forty tons of coal annually, and Dominion and Provincial Buildings, without the owner or agent of such building obtaining a permit in writing signed by the Fuel Administrator."

As you have already been advised there is certain to be an anthracite coal shortage in the Province of Ontario during the coming winter. The Ontario Fuel Administrator, therefore, intends to issue regulations under the above Order-in-Council and give the same effect.

In order that the Fuel Administration may have sufficient data upon which to proceed, Forms A and B have been prepared, copies of which are now enclosed. It is of the utmost importance that you should urge the owners or lessees of all buildings, other than residences, and using 20 tons or more of coal per year, to fill out these forms in duplicate and return the same to you at once. You will then forward one copy of each filled-in form to this office not later than December 10th, retaining the duplicate for your own files.

The forms should be filled in by the owners or lessees of all buildings in your municipality other than private residences, but in order that the work of preparing the data may at the present time be kept within reasonable bounds it will be sufficient to include only buildings using twenty tons or more of coal during the year.

The Order-in-Council covers all public buildings other than those controlled by the Dominion or Provincial Governments and you will, therefore, include in your return county buildings of all kinds, banks, churches, hospitals and other charitable institutions; municipal buildings such as city halls, markets, police stations, fire stations, pumping stations, and transforming stations and all schools and colleges—public, separate or private. These buildings are enumerated not as limiting the class to be reported upon, but so that they may not be met with any suggestions that they are exempted by the terms of the Order-in-Council.

The return of these forms will help us to a better understanding of your local situation, and enable us to handle any available supply to the best advantage. The information regarding the heating equipment, with data already in our hands, will be of great assistance. Each domestic boiler or furnace has a distinctive name and number cast somewhere on its front, and usually every owner is quite familiar with these names and numbers.

We have arranged to insert an advertisement in all the Ontario daily newspapers calling the attention of the public to the necessity of filling out these forms in duplicate, immediately returning them to you. You will kindly forward them to us from time to time, not waiting until all have been returned. These advertisements will appear on the following dates: November 23, 27 and 30.

(Continued on page 27)

FORM "B"

Fuel Statistics of Churches

INCLUDING ALL BUILDINGS USED IN CONNECTION WITH SAME.

Denomination .....

Name of Church .....

Location .....

City or Town .....

State whether heated by Warm Air, Steam, Hot Water or Stoves .....

	Anthracite	Bituminous
Tons of Coal used Winter of 1916-1917		
" " " " " " 1917-1918		

	Grate	Egg	Stove	Nut	Buckwheat
Tons Anthracite now on hand					
Tons Bituminous (Soft) Coal now on hand					

Wood or Gas Used for Heating? .....

Maker's Name of Furnaces or Boilers, with Maker's Numbers and Sizes .....

.....

.....

If Tubular Steel Boiler give diameter and length .....

How many Boilers or Furnaces in buildings? .....

What are you doing to conserve Coal? .....

.....

.....

REMARKS .....

.....

.....

.....

How many Tons of Coal will you save this year? .....

Date ..... *Signed by* .....

To be made out in duplicate and returned to Local Fuel Commissioner. One copy to be retained by the Fuel Commissioner. One copy to be forwarded to Fuel Administrator for the Province of Ontario by the Fuel Commissioner.

Never Too Old To Fight

Moses Irons Picks a Salesman Past the "Chloroform Age"—and Gets a Surprise

By DANIEL LOUIS HANSON Illustrated by F. R. GRUGER

By Courtesy of "System," the Magazine of Business

"I DON'T suppose you recall me, Mr. Irons," said the gray-haired man whom Byshec had admitted to the private office. "We haven't met for over 20 years. Levington is my name, James B. Levington. I worked for you back in the late nineties—"

Moses Irons arose with alacrity and held out his hand in welcome. "Sure I do!" he exclaimed, with a smile of welcoming recognition. "You were out at the West branch; then you made a trip to the Coast with service boxes. Sit down, Levington, I'm mighty glad to see you again. You have changed some, though: wore a mustache in those days, didn't you—a heavy mustache? You look as if the world had dealt kindly with you; you must have been playing fair with it, too."

"Giving so that I could take again," answered the caller reminiscently. "That's what you taught me in those days, Mr. Irons, and I have never forgotten it. I owed the world service and gave it. And it has repaid me all that I gave it—with a little additional. I went into business for myself—made good and stayed at it for over 19 years. Then a few months ago I decided that I couldn't classify my business as 'essential' in these days. I had a chance to sell; so I sold out and cleared up enough to make things easy for my wife and myself even though we should touch the 80-year mark and quite a bit beyond. But lately this thing has been getting on my nerves. I ought to be doing something; 59 isn't the jumping-off place nowadays—"

"I should say not!" exploded the Ironmaster. "It is the getting-on place for those who have been out of the ranks, and the staying-on place for those who haven't been on furlough. You are a young man, Levington, scandalously young."

"And I quit you 20 years ago because I was made to feel that I was getting too old, Mr. Irons," said Levington quietly.

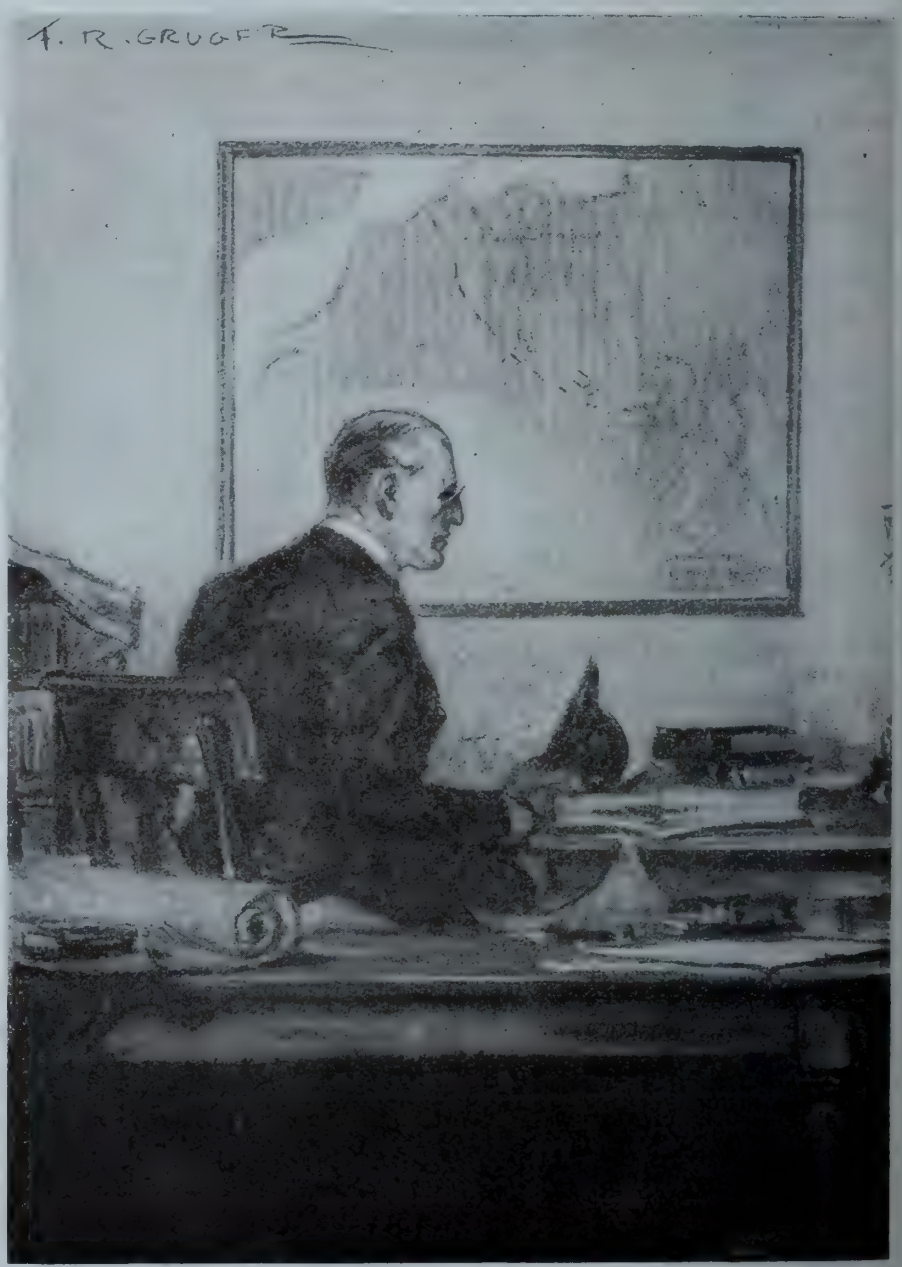
Moses Irons flushed. "I seem to recall that most of us were obsessed then by that folly—'The dead line at 40 and chloroform at 60.' Well, Levington, we were prodigal with both human and material resources in those days—so prodigal that we wasted the better part of each. It has taken fire and sword to give us an insight into conservation, though at that we are yet in the primes. Well, it is mighty good of you to drop in to see me. If I can be of any service to you, Levington, just say the word."

"You are a busy man, Mr. Irons, and I'll be brief; I want to be in the harness again. I must do something to keep my self-respect."

"You want to sell goods, eh?"

"I can sell goods; and I can do other things, too. I can ship, I can receive, I can pack if that's necessary. I want to do something; and knowing you best in this old essential line of sanitary engineering, I came here first. I am going to keep travelling till I strike something. I can't sit by idle when the nation needs every pair of hands that are available.

Moses Irons reached his hand across



"I can sell goods, and I can do other things, too," said Levington. "I can sit by idle when the nation needs

the desk. "Shake hands, Levington," he exclaimed heartily. "I like to hear that kind of good American spirit expressed. What would you prefer doing?"

"Taking my assignment. If you need me, your business judgment will answer that question."

"I need men, Levington—heaven only knows I need men! I need men to go down in the cast-iron pits and up in the brass shop, on the bill desks, on the road—I don't know of a place where we couldn't use men and women who will work, who are willing to keep this organization going while our service flag is filling up. Give me your telephone number and I'll arrange to get in touch with you within 24 hours."

Levington took out a card, made some notations on it, and handed it to Moses Irons. "Calumet 60321, Mr. Irons. And here are the names of a couple of men who have known me during the years I have been out of your sight."

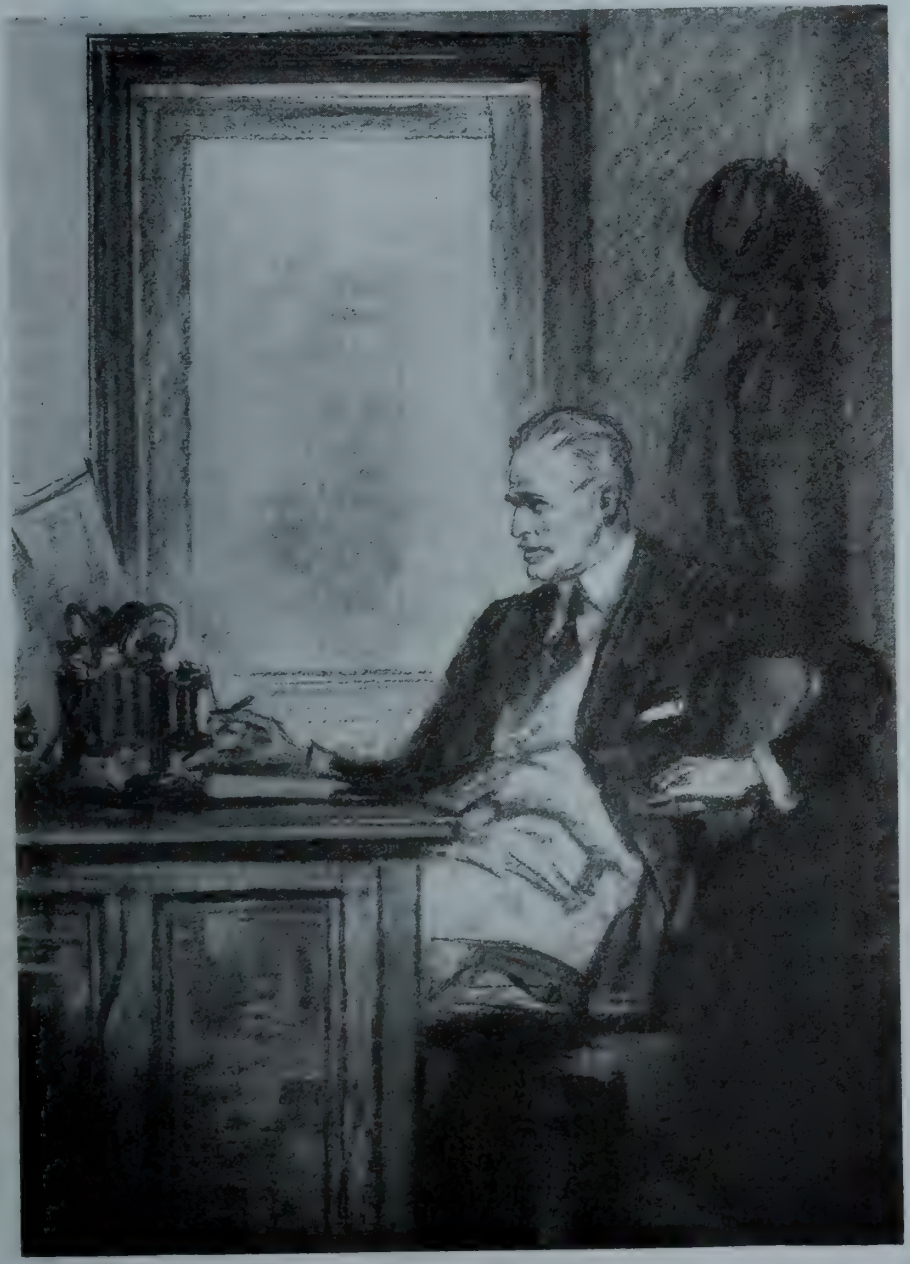
A little later Renwick found on his desk a note that took him to the front office at once.

"John, can you use a live wire in the sales department?" was the Ironmaster's query.

"Don't taunt me!" snorted the sales-manager. "We could use a whole reel of live wires. But what's the use of asking—there aint any live wires to be had." Under mental strain Renwick was inclined to lapse into schoolboy vernacular.

Then Moses Irons told Renwick about Levington and produced the old employment card which covered that individual's service with the concern in bygone days. "He had a good record with us then, John; and he looks and talks like an even better man to-day. I can use him somewhere else, but you have been complaining about shortage on the selling force and—"

"I'll take him," said Renwick hastily. "You won't have to peddle him around. And don't apologize for his years, unless you feel you have to because of his excessive youth. That moth-eaten bromide 'Old men for counsel and young men for war,' is being shot to pieces over there in France and Belgium, where about half the successful generals rightly belong in the grave, if the old saw were to be believed. Give me his telephone number and I'll give Levington a chance to show his enthusiasm for the national welfare by booking orders for sanitary plumbing goods and fuel-saving heating appliances."



receive, I can pack, if that's necessary. I want to do something. I can't every pair of hands available"

II

Four months passed by and Levington was making good; that is, he was turning in such business as was to be had in that period of slackened building and uncertain deliveries of material. Whatever Levington sold had no strings to it, nor was the claim department kept busy working over credit memoranda for his customers. Also, Levington developed—unless he possessed it from the start—a faculty for steering business to his trade; it was "Mr. Jones, I just learned that Meyers over there on Thirty-first and Michigan has lost some tenants in those Windsor Park properties of his because of poor sanitary fixtures. Can't we line him up together?" And invariably he already had a well-outlined programme for lining up Meyers.

In short, although Levington wasn't setting the world afire by selling goods, his business ran high in comparison with that of other salesmen, because he worked it up from the foundation.

Then came the episode of the Westonville pipe deal, which threatened for the moment to sever for all time the connection of Levington with the house of Moses Irons. But it didn't—it had the opposite effect. That's the story—the story of two different viewpoints.

Westonville wanted 1,000 tons of cast iron pipe—and Moses Irons and Company had the pipe. It was somewhat a question of price and John Renwick had quoted a price. But still the old desire was strong with the Westonville board—it wanted to be approached with dignity, to be jollied into placing an order that it was eager to place.

It was 300 miles to Westonville and the only available man was Levington. "All you have to do is to book the order," explained Renwick. "Keep your expenses as low as possible. They could just as well have mailed the order in—but what can you expect from a bunch of city officials like that? Westonville is—but you have read about Westonville, of course!"

Levington left that night for the scene of his order taking. Whether he had any well-defined plan at the time; whether he knew anything about Westonville's unfortunate reputation; or whether as a patriotic American he

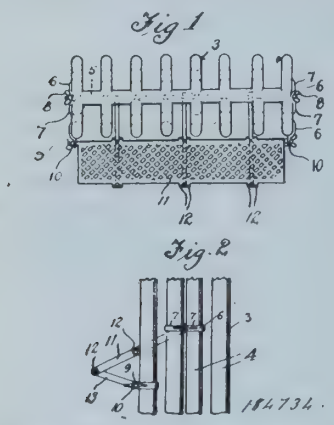
(Continued on page 26)

New Canadian Patents

No. 184,734.

Charley Westman Hinchley, Minnesota, U. S. A., 4th June, 1918; 6 years.

Claim.—1. In a foot rest for radiators, a main support comprising a rod adjustably mounted for adjustment upon the radiator, a second rod mounted for adjustment upon the radiator, a platform member and links, connecting said



No. 184,734. Foot Rest.

platform member and said rods, substantially as described.

2. In a foot rest for radiators, a rod adapted to extend longitudinally of the radiator and through the coils thereof, a second rod mounted upon the exterior of the radiator, clamp members on the extremities of said rods for engagement with the radiator coils, means for clamping said clamps upon said coils, and a platform pivoted between said rods, substantially as described.

3. In a foot rest for radiators, a rod adapted to extend longitudinally of and between the coils of a radiator, a second rod arranged upon the exterior of said radiator, threads on the ends of said rods, clamping members on said rod ends adapted to engage with the coils of the radiator, nuts for engagement with the threaded ends of said rods to bind said clamps into engagement with the coils of said radiator, a platform, spaced laterally projecting ears on said platform, and links pivoted between said ears at their inner ends, and being pivoted at their opposite ends to said rods, substantially as described.

4. In a foot rest for radiators, a main support mounted for sliding movement upon the radiator, means for holding said support against movement, a second support slidably mounted on said radiator, means for holding said second support against movement, a platform, and links connecting said supports and said platform, substantially as described.

5. In a foot rest for radiators, a main support comprising a rod, clamp members slidably mounted on said rod, means for forcing said clamp members longitudinally of said rod, a second support comprising a rod, clamp members slidably mounted on said rod, means for forcing said members longitudinally of said rod, a platform, and links connecting said platform, substantially as described.

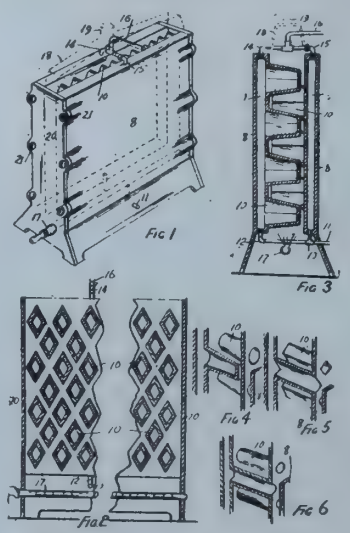
6. In a foot rest for radiators, a pair of supports capable of moving vertically upon a radiator, means for holding said supports in adjusted position, a platform, and links connecting said platform and said supports, substantially as described.

No. 185,175.

James Dawson Jackson, Manly, assignor, Sydney Arthur Josephson, assignee of a two-fifth interest, and Percy Inder, assignee of a fifth interest, both of Sydney, all in Australia, 25th June, 1918; 6 years. Filed May, 1917. Receipt No. 280,371.

Claim.—1. In a domestic water heater of the class specified, a water jacket at opposite sides, hollow baffles open at their outer ends and communicating with the water jackets, the baffles being diamond shape in cross section, tapered from their inner closed to their outer open ends, and the opposite sets of baffles disposed in staggered relation to form tortuous passages between the series of baffles and expose a greater baffle surface to the heated air or products of combustion.

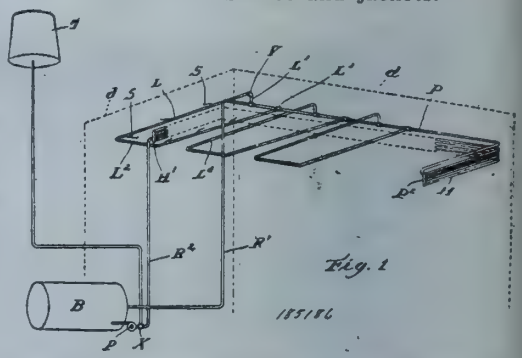
2. In a domestic water heater of the class specified, water jackets at opposite sides provided with supply and outlet means, a series of hollow baffles extending inwardly from the inner walls of the water jacket and having outer ends fully open into the said jackets, the baffles being tapered towards their inner closed



No. 185,175. Water Heater.

ends and diamond shape in cross section, the baffles extending inwardly from the opposite inner walls of the water jackets being disposed in staggered relation to form a plurality of straight tortuous passages therebetween and to expose maximum surfaces of each baffle to the action of heated air or products of combustion, and means for heating the water contained in the baffles.

3. In a domestic water heater of the class specified, a water jacket at each side having inner walls, hollow baffles opening through the said inner walls of the jackets and disposed alternately in staggered relation and providing confined passages for the exposure to heat of the maximum amount of baffle surface, means for supplying the water jackets with water and for liberating the water therefrom, and means for heating the water in the baffles and jackets.



185,186. Heating and Sprinkling System.

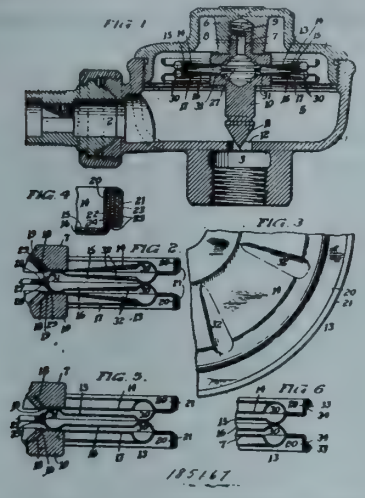
No. 185,186.

The Combined Heat and Sprinkler Company, Boston, assignee of Wilberforce B. Hammond, Auburndale, both in Massachusetts, U.S.A., 25th June, 1918; 6 years. Filed 29th May, 1918. Receipt No. 295,500.

Claim.—1. In a combined hot water heating and sprinkler system, the combination with the characteristic elements of a hot water circulation system, of a circulation loop extending laterally from said circulation system and joined thereto at both ends of the loop, said loop comprising a relatively high reaching riser at one end and a relatively low return connection at the other end, and the pipes of the loop descending gradually from the level of the top of the riser to that at the return connection, and fire protecting sprinklers mounted on the inclined pipes of the loop.

2. In a combined hot water heating and sprinkler system, the combination with the characteristic elements of a hot water circulation heating system, of a circulation loop extending laterally from said circulation system and joined thereto at both ends of the loop, said loop comprising a relatively high reaching riser at one end and a relatively low return connection at the other end, and the pipes of the loop descending gradually from the level of the top of the riser to that at the return connection, fire protecting sprinklers mounted on the inclined pipes of the loop, and an air collecting chamber attached to the loop.

3. In a combined hot water heating and sprinkler system the combination with a main hot water circulation circuit and means to maintain circulation therein, of a circulation loop connected with said main circuit at both ends of said loop, one of its connections being at a higher level than the other to maintain independent gravity circulation in said loop, and fire protecting sprinklers mounted on the said gravity circulation loop.



No. 185,167. Thermostatic Trap

4. In a combined hot water heating and sprinkler system, the combination of a main hot water circuit and means to maintain circulation therein, a secondary circuit consisting of a loop connected at both ends with the main circuit, the connection nearer the source of main circuit circulation comprising a riser from the top of the main circuit pipe, and sprinklers mounted on the pipes of the secondary circuit.

No. 185,167.

Warren Webster & Company, Camden, assignee of James Logan Fitts, Pensuirken, Townshy, New Jersey, U.S.A., 25th June, 1918; 6 years. Filed March, 1918. Receipt No. 292,186.

Claim.—1. In a thermostatic valve, a casing having an inlet and an outlet and a connecting thoroughfare, and a valve piece to control the thoroughfare, in combination with the expansion cell to control said valve piece, comprising a plurality of discs or diaphragms having their outer edges double flanged and reversely bent to form interfitting members of great length in at least five ply assembled condition, and a sealing and joining medium connecting portions of the ends of adjacent flanges constituting the three inner plies, said seam forming a cylindrical flanged structure extending transversely to the plane of the discs and wholly to one side thereof.

2. In a thermostatic valve, a casing having an inlet and an outlet and a connecting thoroughfare, and a valve piece to control the thoroughfare, in combination with an expansion cell comprising a plurality of annular discs, one of said discs being fixed to said casing and the outer edges of adjacent pairs of discs being flanged into cylindrical form and reversely bent to form interfitting circumferential cylindrical members in assembled condition and at right angles to the plane of the discs, and a sealing and jointing medium connecting the ends of adjacent flanges.

3. In a thermostatic valve, a casing having an inlet and an outlet and a connecting thoroughfare, in combination with an expansion cell to control said valve piece, comprising a plurality of diaphragms having their outer edges flanged into cylindrical form and reversely bent to form interfitting members in assembled multiply condition and at substantially right angles to the plane of the diaphragms, a sealing and jointing medium connecting the ends of adjacent flanges, and each of said diaphragms shaped with a circular stamped rib formed therein.

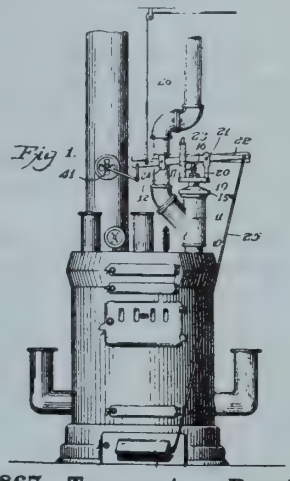
4. In a thermostatic valve, a casing having an inlet and an outlet and a connecting thoroughfare, and a valve piece to control the thoroughfare, in combination with an expansion cell to control said valve piece, comprising a plurality of diaphragms having their surfaces near to the circumference brought close together and their outer edges flanged into cylindrical shape at right angles to the plane of the diaphragms and reversely bent to form interfitting members in assembled multiply condition, a sealing and jointing medium connecting the ends of adjacent flanges.

No. 184,867.

Levin D. Vaughan, Philadelphia, Pennsylvania, U.S.A., 11th June, 1918; 6 years. Filed 8th March, 1918. Receipt No. 291,915.

Claim.—1. In a temperature regulator, the combination with a boiler, of a thermostatic chamber connected to the water circulation therefrom, cast in one piece and having an overhanging hexagonal head, interiorly threaded to the depth of the diaphragm, a diaphragm, means for positioning said diaphragm on a ledge formed by the rim on the upper part of said chamber sealing the chamber therebeneath, means for causing an expansion of said diaphragm, a bushing exteriorly threaded to engage the interior threads of the hexagonal head aforesaid, a yoke having upwardly extending arms adapted as guides for a lever mounted on said bushing, a piston rod passing through an opening in said yoke and through said bushing and held in contact with said diaphragm by adjusting means carried by said piston rod and terminating in a piston head which is solid, the shape of a cone frustum with its base rounded to its slanting side so that when actuated by the diaphragm the contact with said piston head covers only a small area of the base of said piston head, a balanced lever pivotally mounted at an intermediate point on a pin through one of the arms of said yoke and in contact with the upper termination of said piston so that when the piston is actuated by the expansion of the diaphragm it will elevate said lever.

2. In a temperature regulator, the combination with a boiler of a thermostatic chamber connected to the water circulation therefrom, cast in one piece and having an overhanging hexagonal head interiorly threaded to the depth of the diaphragm, a diaphragm, means for positioning said diaphragm on a ledge formed by the rim on the upper part of said chamber sealing the chamber therebeneath, means for causing an expansion of said diaphragm, a bushing exteriorly threaded to engage the interior threads of the hexagonal head tending arms adapted to act as guides aforesaid, a yoke, having upwardly ex-



184,867. Temperature Regulator.

for a lever mounted on said bushing, a piston rod passing through an opening in said yoke and through said bushing and held in contact with said diaphragm by adjusting means carried by said piston rod and terminating in a piston head, which is a solid the shape of a cone frustrum, with its base rounded to its slanting side so that when actuated by the diaphragm the contact with said piston head covers only a small area of the base of said piston head, a balanced lever pivotally mounted, at an intermediate point on a pin through one of the arms of said yoke and in contact with the upper termination of said piston so that when the piston is actuated by the expansion of the diaphragm it will elevate said lever and means for preventing leakage.

NICKEL PLATING BY RAPID PROCESS

Rapid plating is the rule in America. The common practice is to work at 10 to 20 amperes per square foot, using concentrated solutions, but this has been improved upon. It was found that high-grade commercial cobalt plating could be achieved in three minutes when working at 150 amps. per square foot, and a solution of 312 grammes of anhydrous cobalt sulphate per litre. The same practice was then applied to nickel plating, but it was found that the generation of acid cut down efficiency and produced hydrogen at the cathode. This difficulty has been overcome by adding a small quantity of chloride and heating the solution. This done, a 25-gallon nickel cast can be worked at 125 to 150 amperes per square foot, producing heavy, durable deposit in five minutes.

PRACTICAL SHEET METAL WORK

THREE PIECE ELBOW WITH GASKET ON CORE PIECE.

BY THOMAS STANSFIELD

IN many ways the pattern here shown, of a child's bath tub, is similar to the development of a pattern for either an offset or elbow.

The difference, however, is that only half a circle is used with a portion of material flat for the sides.

The first step to take is to determine the slant and depth of the article and to draw the elevation and plan. Only the slanted end is required, as shown in Figs. 1 and 2. Next divide a quarter of the plan into equal parts, beginning at F. 1, 2, 3, 4, 5 and 6. From each of these points draw a vertical line, cutting A B and D, and from 1, 2, 3, 4, 5, A and B, draw a number of lines parallel to B D, intersecting C D.

Now draw a short base line from C, and mark it off as shown, using the measurements developed on line C D; this base line to be at right angles to the dotted lines C. 1, 1, 2, 2, etc., and draw a stretchout line in any convenient place. Transfer the measurements from plan, as shown at F. 1, 2, 3, etc., to the stretchout line until sufficient measurements have been transferred to allow for the whole end of the article.

Now draw lines sufficiently long at right angles with the stretchout line from each point on C. 1, 2, 3, 4, etc.

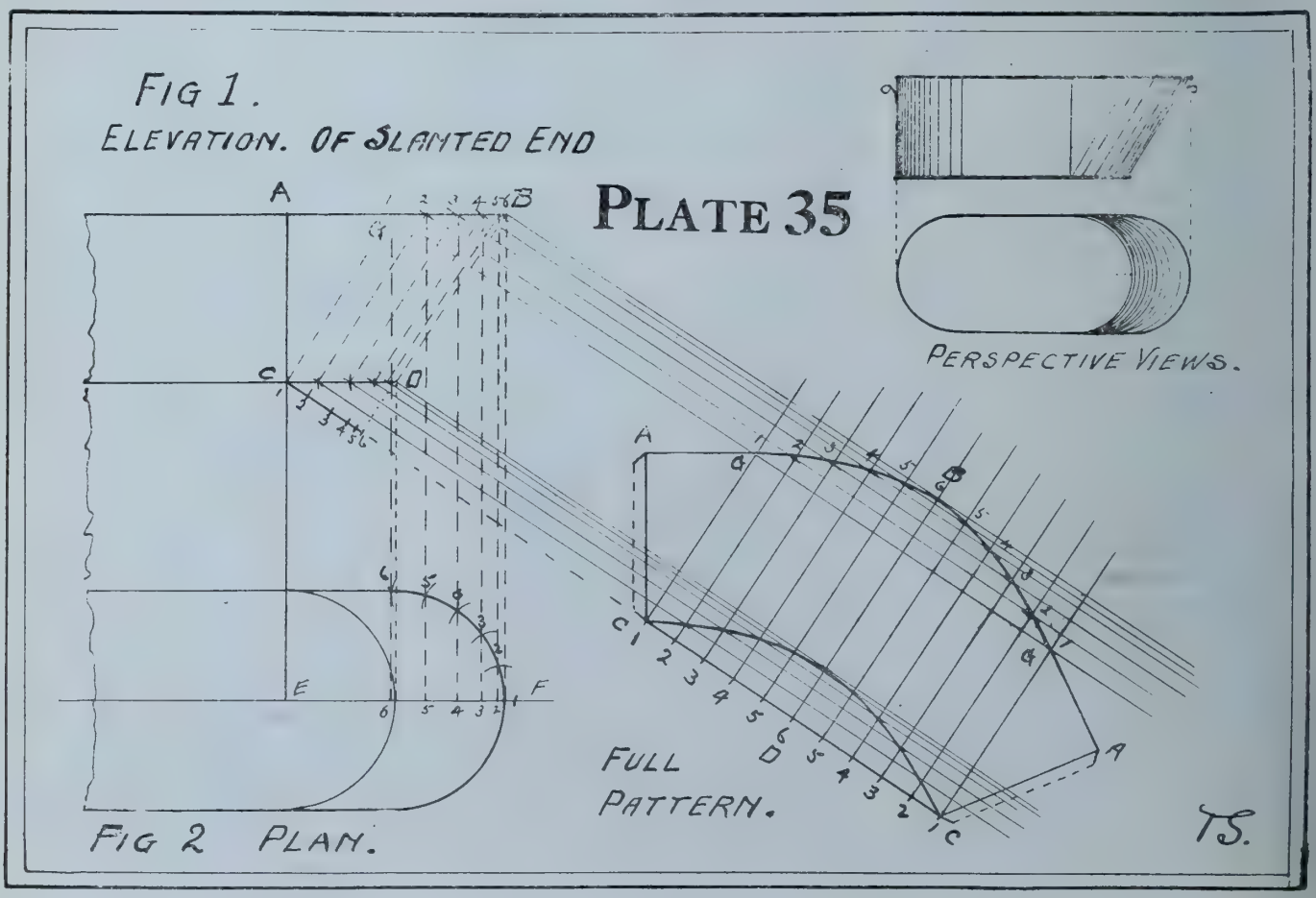
Then draw a number of lines from points of intersection in Fig. 1, A B and C D, until all the lines on stretchout line have been cut. The points of intersection of these lines will show the full pattern of the piece.

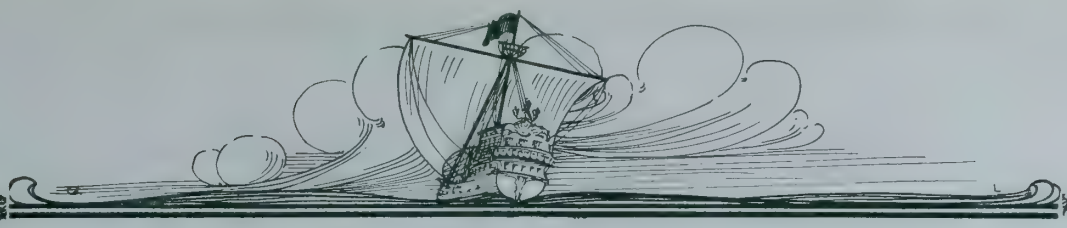
Another method may also be adopted to develop the pattern. Note the short solid base line in Fig. 1, C. 1, 2, 3, 4, 5, 6, and lines C D and A B. By placing the compass on the solid line opening up to the points of intersection on lines C D and transferring these measurements to the stretchout line for pattern the different points to cut are described, which is necessary for the lower part of the pattern. Repeat the same by opening compass to line A and B, Fig. 1, and transferring these measurements to stretchout line.

This dispenses with having to draw the thin lines shown from Fig. 1 to pattern.

Next place the compass at C A, Fig. 1, and with this radius draw an arc with point of compass at C in stretchout line. Then with A G in Fig. 1 as radius, draw another arc from G1, cutting arc just made and connect these two points C and A in pattern, repeating the operation at both ends of the pattern; the material required at each end of the pattern requires to be flat, as shown in both the pattern and elevation at A C G. Allowance must be made for the style of run at the top and base as well as the side seam, the latter only being shown.

(Continued in next issue.)





Sanitary Engineer's Christmas Greetings

LAST Christmas, we were in a death's grapple with "beasts that walked like men." We were fighting for our very existence, against a most barbarous foe. But we were on the right side. As Britons always do, we have won, or rather we should say "Ye have won." Who?

Ye Mariners of England, and,
Ye Men on Flanders' Field.

For such men let us all thank God. Let us just for a moment offer a fervent prayer of praise for those mariners of England, those heroes of the deep.

Dear Readers all, I cannot refrain from recalling some of the deeds done by men of the sea and to do so one must quote certain instances.

From "Goodwin Sands," by William Canton.

"Did you ever read or hear
How the AID—(God Bless the AID!
More earnest prayer than that was never prayed)—
How the lifeboat, AID of Ramsgate,
Saved the, "London Fusilier?"

With a hundred souls on board,
With a hundred and a score,
—She was fast on Goodwin Sands,
—(May the Lord have pity on all hands—
Crew and captain when a ship's on Goodwin Sands!)

Then the poet goes on to relate some of the hardships, the terror of the storm, where stout hearts waited at Ramsgate for the return of the lifeboat "AID," where she made trip after trip, and—

"When a man with glaring eyes
Rushed up frantic to the gangway with a cry in his throat,
Thrust a bundle in a sailor's ready hands.
Honest Jack, HE understands—
Why, a blanket for a woman in the boat!
"Catch it, Bill!"
And he flung it with a will.
And the boatman turned and caught it,
Bless him!—caught it tho' it slipped,
And, even as he caught it, heard an infant's cry,
While a woman shrieked, and snatched it to her breast—
"My baby!"
SO the thirteenth passenger was shipped!!

Readers, it's such spirit that wins. Ye that won on Flanders' field. Those who really fought and shed their life's blood in this war. Were not those soldiers of fortune in days gone by? No. Those soldiers who fought and died at the Marne, at the Somme, St. Julien, Vimy Ridge and Mons, were men whose spirit will never die; it will be inbred in every man of honor, of love and of sacrifice.

No glitter of gold e'er made a hero neither on land nor sea. Those who man the lifeboat, or fight in the front line trenches, are not worshippers of Mammon.

Would to God we had business men gifted with that same spirit. And until we have there will be wars and more wars. Therefore, let us try as best we can, one and all, to view men and honor them by what they have done for their brethren. Let us all try and have the spirit of Christmas all the time. Let us give thanks that we are planning for a peace which we hope will be permanent. With those few thoughts passed on this Christmas, we wish everyone of our readers

A Merry Christmas and A Happy and Prosperous New Year



The President's Christmas Greetings



Montreal, Dec. 16, 1918

To the Members of the Canadian Society
of Domestic Sanitary and Heating:

Since addressing you last Christmas, peace has come and victory won, and we are no longer planning for destruction. No, we are planning for peace, for progress and a better and more brotherly understanding among men of all nations.

No world can be progressive where one nation is not in accord with all for the welfare of all. No people can progress where purely selfish motives predominate. And the same arguments apply to a craft.

The sanitary and heating trade in Canada has practically been at a standstill for four years or more. Every member has no doubt given much thought to some of the evils which are a hindrance to progress in their business. Such being the case, it is to be hoped that those members will plan to be present at the 1919 convention, which is to be held in Montreal. The exact date has not yet been decided upon, but will be reported in "Sanitary Engineer" in due course. So much for the business side of this, my Christmas message.

I sincerely hope that the war has dealt lightly with our fellow-craftsmen, though I know we have lost many, and just at this moment my sympathy goes out to those who "Long for the touch of a vanished hand, the sound of a voice that is stilled." May they be comforted by those left behind to such a degree as to make the burden lighter.

In conclusion, let us all rejoice that the war is over, and in our gladness let us not forget to give thanks unto Him who is ever on the side of right. And that every sanitary and heating engineer in Canada may enjóy

A Merry Christmas and A Happy and Prosperous New Year

is the wish of

Yours sincerely,

A. CHARETTE.

SANITARY ENGINEER

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VOL. XII. DECEMBER 16, 1918 No. 24

A PROPOSED BUILDING PROGRAMME

A VERY important gathering of members interested in the building trade took place a couple of weeks ago in Ottawa. It was well attended and the Government appointed men to be present so as to procure ideas, etc., as to the most practical way of absorbing the fast increasing numbers of unemployed.

Quite a number of suggestions were submitted. One was in connection with the housing problem, which no doubt will soon become a serious one.

Financiers as usual look upon any scheme of Government assistance as an interference on their rights, and labor cannot see how it can live and pay the high prices prevailing for the necessities of life unless the cost of these necessities first take a drop.

However, the best move that can be made is to adopt some measure that will find work for the unemployed. Next there is in reality a scarcity of houses and if financiers cannot see any profit in building houses for renting, there will be little chance of selling houses if wages are not maintained.

So, no matter from what angle one looks, the best way out of it is that the Government find money to build the needed homes. Next, the Government should draw the rents after city taxes have been deducted, and say when conditions have become normal. Put these houses up for sale, not, however, to be unloaded, but sold at prices at which privately-owned houses could be bought for, or at fair valuation.

Then suppose for example, the whole scheme resulted in an outlay of $100,000,000 for the whole of the Dominion and at the end of five years this property is only worth $75,000,000. It would just mean that the price of peace, prosperity and sanitary housing had only required a matter of $5,000,000 a year to procure.

We are only referring to building of homes, and not high priced residences, such as could be bought by wealthy people; all this class of building operations will take care of itself.

One thing is sure, something must be done and done quickly, if labor's desires are to be appeased. Money men may just as well take matters in hand fairly, look the situation in the face honestly if a calamity is to be averted. Labor is only like capital, if it is not kept busy it soon becomes a liability.

THE MAIL ORDER MENACE

DURING a visit to a large United States city recently, the writer discussed the question of keeping in touch with all plumbing work being done in places where no plumbing inspection or plumbing by-laws are in force.

It was agreed that in every district there existed a health officer and in most cases a board of health, but very little attention was being given to plumbing installations, and such being the case some very poor and insanitary conditions were found to exist—fixtures of all kinds, some out-of-date and not permitted to be installed under a regular city plumbing ordinance.

The trouble, it appears, arises from the fact that plumbing fixtures are sold to anyone by mail order houses and hardware merchants whose only care is to sell. This class of merchants would have no objections to sell opium to infants so long as there is profit in the sale. They do not care who buys or for what purpose goods are procured. These merchants have no responsibilities after the cash is in the till and the goods in possession of the purchaser.

There is only one solution to this problem and that is that as plumbing goods are, if wrongly installed, as dangerous almost as opium in the hands of irresponsible persons, there should be some responsibility placed upon the seller as well as purchaser of such goods.

If a mail order house or hardware merchant sell plumbing fixtures that have to be fitted with waste pipes that drain into sewers, or even into septic tanks, cesspools, etc., those merchants should be made to do one of two things. First, they should be made to inform the local board of health of the district to which the goods are being delivered, so that that board or the M.O.H. can see that the fixtures are properly installed, or else these merchants themselves should be held directly responsible for the proper installation of such goods.



Xmas GREETINGS 1918



More Business for Sanitary Engineers

THE war is over and we can now turn our attention to the insistent demand that comes from all parts of Canada for more and better houses.

Already money has been provided. The Dominion Government has announced a policy of spending twenty-five million dollars ($25,000,000.00) for the purpose of providing the necessary housing accommodation, and will also proceed with delayed public works. The Provincial Governments in some provinces have agreed to advance further millions, and many municipalities are speeding up the reports on their housing accommodation, and providing means by which interested parties can obtain loans for the purpose of proceeding with their operations.

A splendid opportunity is presented to the sanitary engineer to take an active part and be interested in all the housing operations in his own locality, and he will be rendering a service to the community and to himself if he insists on the installation of proper sanitary appliances. Proper sanitary appliances mean more comfort in the home, a healthier community and bigger and better business for himself. Now is the time to take an interest in this work, and the building interests should see that Canadian material which gives employment to Canadian workmen, is used in Canadian homes.

Our Company makes a full line of Plumbers' Sanitary Enameled Ware, and will be glad to furnish catalogues and other literature to all who are interested.

Port Hope Sanitary Mfg. Co., Limited

Factory:
PORT HOPE, ONTARIO

Head Office:
ROYAL BANK BUILDING, TORONTO

TORONTO SHOW ROOMS
119 King St. East

WINNIPEG OFFICE
405 Tribune Bldg.

MONTREAL SHOWROOMS
234 Beaver Hall Hill

HALIFAX OFFICE: 58 Bedford Row

GREETINGS
TO THE TRADE

A CHRISTMAS THOUGHT

AT this season of the year, when the spirit of peace and good-will towards men is in the air, we would all do well to try and create in ourselves that same spirit in every day.

Why not?

The same sun shines. The Great Creator cares the same for all. He changeth not, then why should we? Let us all live the Christmas spirit the whole year round.

That is our message to every member of the sanitary, plumbing and heating trade this Christmas.

May every member of the trade enjoy a Merry Christmas and a Happy and Prosperous New Year.

THE
WALLACEBURG BRASS & IRON MFG. CO.
LIMITED

WALLACEBURG, ONTARIO



CHRISTMAS AND NEW YEAR'S

Greeting

To Each and Every Member of the Trade

Last Christmas was full of hope that Victory would be attained by our army and navy.

We did not hope to crush the human but rather the inhuman element, the destructive militaristic spirit.

To some extent this has been done, and the Victory is ours. Let us now all join in establishing a peace free from battlefields, free from strife that hurts.

Let us rather strive for things that make strong the heart, strong the soul; let us build up Canada and Canadians. And with such a spirit abounding in the hearts of each and all

LET'S ALL ENJOY
A MERRY
CHRISTMAS
: 1918 :

Canadian Wolverine Co., Limited

CHATHAM ONTARIO



W. G. Harris
President



Wm. G. Harris, Jr.
Vice President

We appreciate the kind favors of past years and extend to you our heartiest wishes for a Merry Christmastide, a Healthy, Happy and Prosperous 1919.

The Canada Metal Company, Ltd.

MONTREAL HAMILTON TORONTO WINNIPEG VANCOUVER

WE HAVE *EVERYTHING* FOR THE PLUMBER

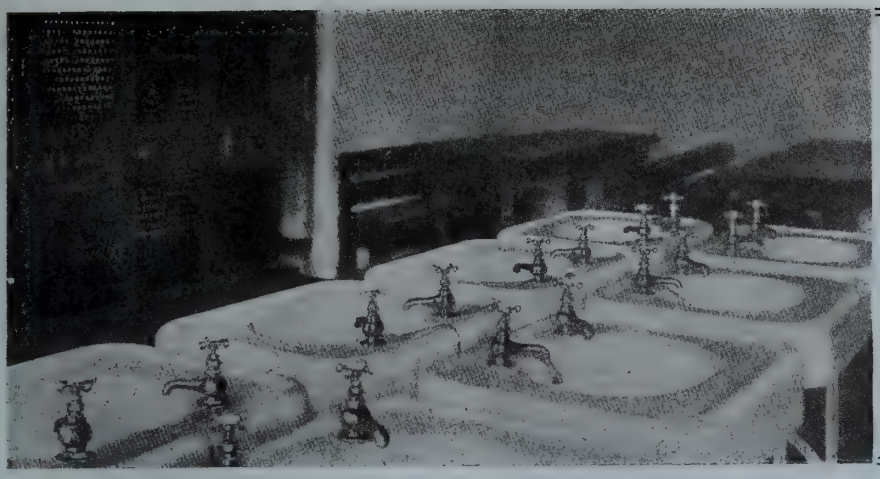


A Merry Christmas

Once more we offer all our customers the Season's Greetings, looking forward to the New Year —may it bring you increased prosperity. We know it will if you use Mueller Brass Goods.

H. MUELLER MFG. CO., LTD.

SARNIA :: :: ONTARIO



FACTORY SANITATION

Water supply and sewage disposal problems have often been almost unsurmountable to many factory managers. Care must be taken when choosing locations.

By THOMAS STANSFIELD
Sanitary Engineer

The above illustration shows a battery of individual lavatories, set up in wash room of a large institution. They are in a double row, with open spaces all round. The lavatories stand on cast iron enamelled legs. All piping is easily accessible.

WATER SUPPLY FOR INDUSTRIAL PLANTS

THE previous articles on factory sanitation that have appeared in preceding issues have dealt with the providing of washing, bathing, etc., and with W. C. and locker conveniences for work people. And the last article dealt more with drinking water supply, etc.

But there is also the water supply for industrial purposes to be given considerable thought, when a plant is being located in a district.

In all manufacturing plants, some form of motive power in more or less quantities is required. If electric current is easily available, only water for domestic purposes will likely be required, and this would solve in no small way the sewage disposal problem. But if steam power has to be generated, the water supply is quite another problem.

For example, all boilers require soft water for feed water, which too must not contain too high a percentage of solid matter, else the closing down of boilers will result, or a system of water filters would have to be put into commission. Many industries depend for the quality of their products to a great extent on the chemical properties as well as the quality of the water available. Take for example dye works, or paper making, the latter as a case in point. Many large paper mills are located in certain districts chiefly on account of the quality of the river water which is particularly suitable for the manufacture of high grade paper.

To obtain the right quality of water, then, is one of the first considerations. But if suitable water cannot be obtained from a natural source, the next best step to take is to treat the water with chemicals so as to make it as nearly suitable for the purpose required as possible.

It would be quite reasonable to assert that in no locality can pure water be procured. All natural water contains more or less foreign matter either in suspension, which is easily purified or chemical which is more difficult to treat, the latter condition of water often involves the distilling of such water. The relative degree of purity of water may be classed as follows:

1. Rain water procured from the roofs of buildings.
2. Melted snow.
3. Water from shallow excavated wells.
4. Water from deep bored wells or springs.
5. Sea water.

Just to illustrate how necessary it is to give much thought to the water problem. A certain industry was established in a rural district and for many years derived the water from the roofs of buildings and a small swiftly running creek. The creek however went dry, and as the business had been enlarged more water was necessary. A number of shallow wells were dug, the management thinking that they would procure soft water. They did. But it was found that the nature of the soil through which the water had to percolate was such as to nearly ruin the product manufactured. An extensive filtration plant had to be constructed which entailed extra cost. This just illustrates the fact that as water is one of the finest solvents of almost any matter, care has to be exercised in many ways when locating an industrial plant.

In designing the water supply for a factory, then, it is well to keep in mind the fact that the quality of the water will affect the industry, and inquire into the quality of the water available. Of course the suitability or unsuitability of the water cannot always determine the location of the plant, for other considerations such as fuel, raw materials and transportation must be taken into account. But if the water cannot determine the location of the plant, the plant can determine the quality of the water, and provision should be made to so treat the water that it will be suitable for the purpose desired. Fortunately, hard water can be made soft; soft water can



Exterior view of one of the many wash rooms and lavatory buildings at the Port Colborne Refinery of the International Nickel Company of Canada, Limited.

be made hard; iron can be removed from water, as can sulphur also, so that whatever quality of water is desired by a manufacturer, within reasonable limits, can be had, and should be provided.

Disposal of Sewage

The disposal of sewage from manufacturing plants must receive certain study. For example, there is the purification as well as the disposal of sanitary, or shall we say domestic sewage, such as human wastes, from W. C's, lavatories, etc. There is also the industrial or manufacturing wastes, the separating and reclaiming of industrial wastes which are carried off from tanks and vats. These latter materials represent not only a waste, but also a loss to the business, and as a rule are particularly objectionable, even though they are discharged either into a stream, or conveyed to a purification plant for treatment, and one serious problem to many a management is how to abate such nuisances and at the same time reclaim such wastes, in an endeavor to create a profitable by-product which would otherwise result in a serious monetary loss.

Many factories are located outside of the city limits, remote from the public sewers, so that they are confronted with the problem of disposing of all their sewage, sanitary and industrial, without creating a nuisance. Those located within the cities now use the public sewers for all wastes, but the demand for conservation of waterways from sewage pollution will soon affect city and country factories alike. The time is not far distant when as a matter of common decency cities will purify all sewage before discharging it into streams or lakes; and when that time comes, industrial wastes will very likely have to be treated before discharging into the public sewers.

In factories remote from public sewers, the problem of purifying and disposing of the personal sewage is comparatively simple. Septic tanks, aerators and filter beds, all of which can be built underground will take care of that portion of the waste. The industrial wastes, on the other hand, present a new problem to solve in each particular case, and unless similar problems have been worked out before, under exactly the same conditions, it is better to fit up a small experimental plant first, to find out just what methods and proportions are best for the purposes, than to take a chance on building a large plant, basing the methods and proportions on theory. In mills where wool fibre or cotton fibre form a considerable part of the solid matter in the industrial waste, the fibre must be intercepted before it reaches the filter beds, otherwise it will clog the beds and soon put them out of use.



Interior view of one of the many wash rooms and lavatory buildings at the Port Colborne Refinery of the International Nickel Company of Canada, Limited.

It will therefore be seen that the water supply for industrial purposes, as well as the disposal and reclamation of factory wastes are very important matters to have thoroughly discussed when the location of an industrial plant is under consideration.

(To be concluded in next issue).

NEVER TOO OLD TO FIGHT

(Continued from page 13)

started out with a grouch against that town for wasting time and transportation; which of these was true is hard to say. It seems likely that the patriotic grouch is the best explanation. At any rate it was a night ride, which meant a Pullman smoking room for part of the time. And everyone knows the quantity of gossip that can be picked up in a Pullman smoking room.

However, that may be, Levington didn't bob up in Chicago with the order on the second morning, as Renwick had confidently expected; he didn't show up at all that day, nor did he send word until along toward evening.

That word was a telegram from Riverton, which as everyone knows is 100 miles or so distant from the notorious Westonville: "Will be delayed another 24 hours." Nor was there any letter in the next morning's mail. This so worried Renwick that he telephoned to one of Levington's intimate acquaintances to ask whether the absent salesman was, or ever had been, a drinker. But Levington's reputation was unspotted by alcohol.

Next morning a letter did come from the north, but in it Levington gave little information. In fact, after Moses Irons read it he remarked: "He writes in order to conceal. I wonder what he is up to—or what that bunch of aldermen is trying to do to him."

All anxieties, however, were set at rest late that afternoon by a second telegram from Levington which read, "Will bring order in to-morrow morning."

But, of course, Renwick had to grumble a little. "Lost two whole days in writing down an order which was already cinched!" was his querulous comment to Moses Irons.

"So you booked that order at last!" said Renwick when Levington made his belated appearance well along toward noon next day. "I expected you at 8 o'clock, so telephoned Dexter you would be out to see him by 10. Had to send Moxson instead."

"I have been mighty unfortunate in my choice of trains these last few days," apologized Levington. "I've been in two wrecks—one the first night out, and then a split rail this morning up near the Wisconsin line."

"But you got the Westonville order, and so it's all right," said Renwick expectantly. Generally returning salesmen held their orders in front of them on entering his presence; the expense accounts came later.

Levington shook his head. "I couldn't do business with Westonville."

Renwick sat up with a jerk. "They threw us!"

"It's a pretty poor bunch, that up at Westonville," said Levington. "But I had better begin at the first. When you spoke of the town that afternoon, I didn't know much about it. The papers have been full of real war news lately, and I had never been there. That's probably why I didn't notice. But I had a whole evening in the smoking room, and naturally I managed to pick up some information about the place.

"You can imagine about what I learned. I hadn't supposed that any town would have stood for a moment the reputation Westonville has earned during this last year. The decent, patriotic element which is numerically superior in every American town should certainly have exerted itself and have put that bunch of officials out of sight. But it hadn't, and so Westonville is a name to blush at."

"I knew all that before you went," snapped Renwick.

"But I didn't, you see. I learned it that night. Early the next morning, when we were still 100 miles from Westonville we had our wreck; that closed the line until after noon. We were near Rivertown, however, so I hired an automobile and went over there. Ever been to Rivertown, Mr. Renwick?"

"No I haven't. But you wired that you had the Westonville order!" The

sales manager was never patient with stories of sales defeat.

"I am afraid that was a misunderstanding," replied Levington. "If you will let me go on, I'll be brief in explaining. Well, Rivertown is on the jump—just on the jump, sir! Their motor plants and the big machine shops are working night and day on government work, and the population has almost doubled in six months. Talk about State and Madison Streets. Why Main and Exchange Street in Rivertown—well I'd rather take my chances here on Chicago's busiest crossing than on that one in Rivertown! Of course, the housing problem is serious—and the fire protection problem is most serious of all. They have waterworks, of course; a mighty good system. But there are not enough mains to reach out in the direction the town has to grow. Well, the wreck wasn't cleared away until four that afternoon. So I again telegraphed the aldermanic bunch up there, to conserve their official dignity. I stayed with the Rivertown works superintendent and the water board. That night I went to Westonville."

"Yes. And why did they turn you down?" demanded Renwick fretfully.

"They didn't."

"But, good heavens, man! Not two minutes ago I heard you say that you didn't get the Westonville order!"

"That's another matter, Mr. Renwick, if you will let me explain. I met those aldermen the next morning. It was pretty hard to treat them with respect, for there wasn't an American among them! They gloried in the far-advertised fact that they had made a slacker town of Westonville. That they, some five in majority, had put an eternal shame on the city! That was their boast! The town, as you know, isn't a manufacturing community. It is just a sleepy joint made up of retired this and retired that—with less backbone than any place I ever have seen. But that is plainly indicated by their remaining quiet under the reputation their aldermen have given them.

"They wanted this thousand tons of pipe to run out to a little park in the suburbs—there already was a four-inch main taking care of drinking fountains and sanitary plumbing—so as to operate some new-fangled ornamental fountains. One of the aldermen had a design of the new improvement and was as proud as Lucifer of it. He wanted to know if I knew what it was the copy of."

"Well, did you know?" This was hardly a question, from Renwick. It was rather an explosion of nerve.

"Sure I did. I told him where I had seen it. Only I wasn't very diplomatic about it, and we almost got into a fist fight. When I remembered where I had seen that design in actual operation as a fountain, I felt mad enough to fight the whole city council."

"So they refused you the order?"

"Oh no! They seemed more anxious than ever to have me book it; they said, in fact, that the order was already placed and that I had been sent up to write down sizes and quantities. That seemed almost true; but I had some perfectly good excuses ready for delaying the ceremony until evening.

"Then I called on the two editors in town—mighty decent chaps, but afflicted with mild attacks of cold feet. They told me a few things, and I told them a few. Between us we learned a little of what was going on, and why. You can read later what the two evening papers had to say about those aldermen and their unpatriotic extravagance in buying a thousand tons of pipe to operate a fountain that by its very design was an insult to every American living—and dead."

"So because of that they refused you the order, I suppose." Renwick was obviously wearied.

"Oh no! At the public meeting that evening, I got up and refused to sell the pipe to Westonville. The 500 men and women there cheered me for 10 minutes, and then hissed their aldermen when they got up to speak."

John Renwick read over slowly both the newspaper articles which had brought about that meeting, and the next day's account of what had happened there. He read them slowly, for he had to do some rapid-fire thinking. Renwick had always been a sales manager; later had come the consciousness that he was a citizen and even that had come about only in the old days when citizenship didn't touch the pocket.

In spite of his natural pain at the loss of an order he smiled his approval when he looked up.

"You did right, Levington," he commended. "And you certainly have the true instinct of an advertising man. This ought to be worth thousands of dollars as an advertisement of Moses Irons' patriotism, if he wanted to consider it merely in that light, which I don't think he will. Mr. Irons will undoubtedly be hugely pleased. But now we still have 1,000 tons of eight-inch pipe on hand."

"Hardly," replied Levington as he got up. "You see I already had sold it to Rivertown before I had any talk with that Westonville bunch. And Rivertown can use a lot of six and four. Besides the Westonville order—well, that recall law they have up in that state means something doing within 60 days. You see my message was right. I had sold the pipe."

III

IT was some hours later before Renwick recovered his speech sufficiently to narrate the episode to Moses Irons, and to hand him the Westonville newspapers. Moses Irons listened, and read the items carefully. Then he took the ever-present, worn little red book from his vest pocket and made a brief notation.

"John, on your way out tell Ben to indicate on the ledger that Levington is to have a bonus of a $500 block of the fourth Liberty bond issue. Then tell Levington that it is as a bonus on this sale. But you and I will know that it is given because he has taught the sales manager—and the head of this concern as well—a lesson in true patriotism."

FUEL MUST BE CONSERVED

(Continued from page 11)

It is important that you should through your newspapers and otherwise emphasize to the public the certain shortage of anthracite coal in this province during the coming winter. This province will not receive a sufficient quantity of anthracite coal this year to permit anthracite consumption as in past years and, therefore, a saving must be made. When the enclosed forms have been filled in and returned to the Fuel Administration office the proper regulations will be issued, but you should at once urge the owners of residences who have more than forty tons of coal in stock, and the owners or lessees of buildings and governing bodies of institutes who have anthracite coal in stock and who are able to burn bituminous, to take immediate means to dispose of their anthracite supply to their friends and neighbors so that they may at an early date and while there is a surplus of bituminous coal secure their new stock of bituminous coal and place themselves in such a position that the new regulations will not apply to them.

The Ontario Fuel Administration is anxious as far as possible to take the necessary measures for fuel conservation with as little inconvenience as possible to the public and infinitely prefers voluntary effort and an agreement with those affected rather than the enforcement of regulations. It is, therefore, hoped that those who will come under the regulations will take the necessary steps now to protect their own situation and to facilitate the domestic users in securing supplies of anthracite coal.

Enclosed you will find copies of a circular to Boards of Education and School Trustees which gives you full information with regard to the heating of schools. Kindly see that these letters are placed in the hands of the various School Boards.

You will note that Dominion and Provincial buildings are excluded from the Order-in-Council. It is important that we should call the attention of the public to the fact that the Dominion and Provincial Governments have entered into an entirely satisfactory arrangement with the Ontario Fuel Administration whereby in every possible instance the use of bituminous coal will be substituted for anthracite for heating of public buildings. It will be useful if you will yourself fill out forms covering the Dominion and Provincial buildings in your municipality so that we may have this additional informaton.

All churches are public buildings and, therefore, will be covered by the regulation and will require to use bituminous coal where their furnaces are adapted for its use.

Aside from these regulations it is important that all classes of fuel should be

Continued on page 32

Market Conditions and Tendencies

Statements Regarding Supplies and Trend of Prices

THE MARKETS AT A GLANCE

JOBBERS' prices on both black and galvanized sheets show further revision. The new scale of quotations provides for a decline in black sheets of around ¾c per pound and in galvanized of about ½c per pound. The new basis established is not the result of lower mill prices but represents a readjustment by jobbers to a scale more in line with actual market price, with probability of better deliveries at an early date.

Metal markets show a decidedly fluctuating tendency and the market to-day is in the buyers' favor. Lower prices have been named on tin, spelter, antimony and lead. The revision in price of lead has brought about a change to lower quotations on lead pipe, waste pipe and lead sheets. The decline in tin combined with lead has resulted in solder prices undergoing revision downward, to-day's figures being substantially lower than those prevailing a couple of weeks ago.

Indications are that supplies of boiler tubes have almost overnight shown improvement. The mills in the United States which have been holding back on deliveries for one reason or another are now shipping orders which have been accumulating for weeks and months. These goods were bought at fairly high figures and there will probably be a scramble to place these to advantage.

TORONTO, Dec. 12.—Lower prices have been named on lead, tin, spelter and antimony since last issue. The decline in lead has been a factor to bring about a decline in lead pipe and waste and along with lower prices on tin has resulted in a reduction in solder quotations. Black and galvanized sheets have been revised downward while other lines generally are steady and unchanged.

Range Boilers Firm, Unchanged

RANGE BOILERS.—No new developments are reported this week. The market remains quite steady and unchanged at levels shown herewith:

	Standard	Extra Heavy
30-gallon range boilers	$14.00	$17.00
35-gallon	17.00	20.50
40-gallon	20.50	24.00
52-gallon	28.00	32.00
66-gallon	37.00	42.00
82-gallon	45.00	50.00
100-gallon	62.00	70.00

Steady Tone Marks Enamelware

ENAMELWARE. — The market is steady with a fair amount of business passing to complete work on buildings started some time ago. A firm tone rules and no immediate change in values is looked for.

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Basins, flat back, 14 x 15 in.	6 00
Do., corner, 15 in.	5 95
Sinks, roll rim, 18 x 30 in., staple	16 80
Closets, oak tank and seat	27 00
Do., enamel iron or white vitro tank	29 00

Market Steady in Soil Pipe, Fittings

SOIL PIPE, FITTINGS.—The basis of soil pipe is pig iron and with this maintained at an unchanged price level there would seem to be no reason for any immediate change on soil pipe and fittings. The outlook seems to be for a fairly steady market with supplies working around to a point where they are much easier to procure. Cast and malleable fittings are quoted at unchanged discounts.

SOIL PIPE AND FITTINGS

Medium and extra heavy soil pipe, 2 in. to 6 in.	15%
Medium and extra heavy fittings, 2 in. to 6 in.	25%
8in. soil pipe and fittings	Net list

C. I. PIPE FITTINGS.

Cast iron fittings	Net List
Plugs	15%
Bushings	18%
Flange unions, standard	Net List
Dart unions, ¼-inch to 2-inch	15%
Do., 2½ in. and larger	6½%
Nipples, up to 4-inch	45%
Do., 4½-inch and larger	40%
Do., running thread 4-in. and under	25%
Couplings, 4-in. and under	35%
Do., 4½ in. and larger	15%

MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittgs., Class A, lb.	.60	.75
Do., Class B., lb. net	.27	.37
Do., Class C., lb. net	.19	.27

Valves Hold at Unchanged Levels

VALVES.—The market rules without change this week. Business offering is seasonable, which means along comparatively narrow lines.

	Discount off list
Ground work	40
Compression work, standard	45
High grade	41
Cushion work	40
Fuller work, standard	43
High grade	36
Basin cocks, No. 0 standard	38
Nos. 1 and 2	38
Bath cocks	48
Flatway stop and waste cock, standard	45
High grade	45
Roundway stop and waste cocks, standard	45
High grade	45
Brass steam cocks, standard add 10%.	
Globe, angle and check valves, standard.	Net
Do., removable seat	Add 5%
Radiator valves, standard	10
Do., removable seat	Net List
Patent quick opening valves	30
Basin Cocks—	
No. 0 and 1, Fuller pattern	43
Globe, angle and check valves, standard, medium pressure	10
Radiator valves, standard med. pressure.	30
Radiator valves, removable seat, medium pressure	25

Waste Holds Steady; Oakum Unchanged

WASTE, OAKUM.—There have been no new developments to record in waste during the past fortnight. Business is very good and prices maintained. Similar conditions may be said to apply to oakum.

	Per 100 lbs.
Best American	$21 00-$22 00
Clipper, spun	- 21 00
Do., unspun	- 10 50
Plumbers', spun	10 00- 10 50

Wrought Pipe Holds Unchanged

WROUGHT PIPE.—A steady, quiet tone prevails in the market on pipe. The demands of the trade are not so very

heavy and most urgent requirements being met. There are still some back orders to be cleaned up. The outlook seems to be that steel may gradually assume more nearly normal supply and a good healthy business is looked for during 1919.

WROUGHT IRON.
Price List No. 37—September 11, 1918
Standard Buttweld

	Steel Per 100 feet Blk.	Steel Per 100 feet Gal.	Gen. Wrot. Iron Per 100 feet Blk.	Gen. Wrot. Iron Per 100 feet Gal.
⅛ in.	$ 6 00	$ 8 00	$.....	$.....
¼ in.	5 22	7 35	5 52	7 65
⅜ in.	5 22	7 35	5 52	7 65
½ in.	6 63	8 20	7 06	8 71
¾ in.	8 40	10 52	8 97	11 09
1 in.	12 41	15 56	13 26	16 41
1¼ in.	16 79	21 05	17 94	22 20
1½ in.	20 08	25 16	21 45	26 54
2 in.	27 01	33 86	28 86	35 71
2½ in.	43 29	54 11	.....	.....
3 in.	56 51	70 76	.....	.....
3½ in.	71 76	88 78	.....	.....
4 in.	85 02	105 19	.....	.....

Standard Lapweld

	Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
2 in.	$ 31 82	$38 30	$33 70	$40 20
2 ½in.	47 97	58 21	50 90	61 10
3 in.	62 73	76 12	66 66	79 90
3½ in.	78 20	96 14	82 80	100 00
4 in.	92 65	114 00	98 10	119 00
4½ in.	112 00	137 00	125 00	149 00
5 in.	130 00	159 00	145 00	174 00
6 in.	169 00	206 00	188 00	226 00
7 in.	219 00	268 00	243 00	292 00
8L in.	230 00	281 00	255 00	306 00
8 in.	265 00	324 00	294 00	353 00
9 in.	317 00	388 00	.....	.....
10 L in.	294 00	360 00	326 00	392 00
10 in.	379 00	464 00	420 00	505 00

Terms 2% 30 days, approved credit.
Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Boiler Tubes Make Recovery

BOILER TUBES.—Tubes are coming forward to Canadian dealers in large lots. In fact they can get all the tubes they want now, and almost any kind, or size. Some of those interested in the trade are rather skeptical about the remarkable recovery that is being made in the ability of the mills to furnish the supplies of tubes to Canadian dealers. The tube situation was bad for a good many months. In fact it was impossible to secure a two-inch tube and they were badly needed for repair work. Canadian dealers were told, when they approached the mills on the other side, that it was impossible to give them the stocks they required. Their mills were entirely on war work, and furthermore it was impossible to secure skelp to send to the rollers as the metal was passing through the open hearths to other purposes. Now, almost the day or week that the armistice is signed, the Canadian dealers are informed that their orders, accumulations of weeks or months, are on the road. Certain it is that the tube rollers could not have recovered so rapidly, and it looks as though they had been keeping a strategic reserve against a bad day, and that the Canadian dealers were now being avalanched from this. These tubes are coming in at a fairly high price, and, of course, there will be more or less of a scramble to place them before the era of high values has become a memory.

BOILER TUBES—	Cold Drawn	Lapweld
1 inch	$36 00	$.....
1¼ inch	40 00	.....
1½ inch	43 00	36 00
1¾ inch	43 00	36 00
2 inch	50 00	36 00
2¼ inch	53 00	38 50
2½ inch	55 00	42 00
3 inch	64 00	50 00
3¼ inch	.....	58 00
3½ inch	77 00	60 00
4 inch	90 00	75 00

Prices shown are under revision downward.

Further Revisions in Sheets, Plates

SHEETS, PLATES. — Further revisions have occurred in the jobbers' prices on sheets and plates. These provide for a lower scale of quotations than have been ruling. This is not a result of declines at the mills, but is the result of an effort on the part of jobbers to get down to a basis more in line with the actual market. Little revision from figures now reached is looked for, and the question of supplies seems somewhat brighter. A fair tonnage may move from the mills this month and about February or March it is expected that deliveries will reach fairly substantial figures so that jobbers will not have to scrape along on such narrow margins as has been general the past few months. Range of quotations now ruling are:

BLACK SHEETS—	Per 100 lbs.
10 gauge	$....-$7 50-$8 50
12 gauge	6 85- 7 35- 8 35
12 gauge	6 90- 7 20- 7 90
16 gauge	7 00- 7 25- 8 00
18-20 gauge	....- 7 30- 7 80
22-24 gauge	....- 7 35- 7 85
26 gauge	....- 7 40- 7 90
28 gauge	....- 7 50- 8 00
3-16 inch plate	....- ....- 7 40
¼ inch boiler plate	....- ....- 7 00

Prices shown are for full cases. An extra charge of 25c per 100 lbs. is made for less than case lots.

GALVANIZED SHEETS—		
10¾ oz.	$9 30	$9 50
U.S. 28	9 00	9 20
U.S. 26	8 70	8 90
22 and 24	8 55	8 75
18 and 20	8 40	8 60
16	8 25	8 35
14	8 15	8 25

Prices shown are for full cases. An extra charge of 25c per 100 lbs. is made for less than case lots.

Lead Pipe Down; Solder Goes Lower

LEAD AND ZINC PRODUCTS. — The further decline in pig lead has brought about a revision in prices of lead pipe and lead sheets to lower levels. New figures provide for a decline of about 1c per pound, lead pipe now being quoted at 14c per pound; waste pipe at 15c; lead wool, 14c; lead sheets, in rolls, 12½c.

Lower levels have been reported in prices of solder, the decline in pig lead and pig tin bringing about this revision in solder prices. Guaranteed is being quoted as low as 44c per pound; strictly, 41c; commercial, 36½c; wiping, 35½c; wire, 49½c.

Lead pipe, lb.	....	$0 14
Lead waste pipe, lb.	....	0 15
Lead traps and bends	....	Net list
Lead wool, lb.	....	0 14
Lead sheets, 4 to 6 lbs. sq. ft., in rolls, lb.	....	0 12½
Cut sheets ½ to ¾c lb. extra and cut sheets to size, 1c lb. extra.		
Solder, guaranteed, lb.	0 44	0 50
Solder, strictly, lb.	0 41	0 47
Solder, commercial, lb.	0 36½	0 41
Solder, wiping, lb.	0 35½	0 45
Solder, wire, lb.	0 49½	0 54
Zinc sheets, per lb.	....	0 26

Old Materials Dull, Inactive

OLD MATERIALS. — Scrap metal business is poor. It was poor last week and it looks as though it would be poor for some time to come. Dealers are not offering on any available material, and users are not in the market for any considerable tonnage. The feeling sems to grow that there will have to be a readjustment of the iron and steel situation before there is much of an improvement in the scrap metal trade. Prices shown are nominal only.

Dealers' Buying Prices

Tea lead	$0 05¼	$....
Heavy lead pipe	....	0 08
Yellow brass	0 12	0 13
Red brass	....	0 21
Light brass	....	0 09½
Heavy zinc	0 05½	0 06
Heavy copper	0 22	0 23
Stove plate, per ton	....	25 00

Lead Lower; Tin Antimony, Spelter Down

INGOT METALS.—The market locally shows considerable fluctuation, tin, antimony, lead and spelter being lower in some quarters. There is an evidence on the part of some holders to unload stocks.

COPPER.—The trade is moving along in a routine manner. Production figures for November show a decline over October figures. At a meeting to be held December 15 between copper interests and government officials some announcements as to future course to be followed may be expected. Locally prices hold at 30-32c per pound, which means no change.

TIN.—Lower prices have been reached in some quarters, quotations now ranging from 80c to 85c per pound. The trade seems to want to clean up on the available stocks, though there are no further shipments reported moving to this market.

SPELTER.—Spelter at 10c per pound is now the figure reached by some interests, 11c is outside price. Primary points show a somewhat weaker tone in spelter. There is little moving and this condition extends to local activities.

LEAD. — Lower levels have been named on lead this week. Prices now range as low as 8¾-9c and up to 9½c per pound. The market is dull and trading confined to limited lots.

ALUMINUM.—The established price on this metal still holds and there is as yet little marked interest commercially. Prices range locally at 50c per pound, a nominal figure.

ANTIMONY.—Figures named in some quarters show a decline from those in last issue resulting in a distinct narrowing of the range of prices which are now from 10c to 12c per pound. Little of interest has transpired lately in this market.



SOLDIERS' CIVIL RE-ESTABLISHMENT

Major L. L. Anthes, of Anthes Foundry, Limited, Toronto, has been appointed director, and T. A. Stevenson, secretary of the Toronto Trades and Labor Council, has been appointed assistant director, of the demobilization branch of the soldiers' civil reestablishment. Lieut.-Col. Healy and Lieut.-Col. Clark will act on the demobilization board with the other two. Major T. A. Anderson has been appointed supervisor of questionnaires.

ST. THOMAS FIRM TO GET BIG CONTRACT

Although there has been no official notification that his tender has been accepted, A. E. Ponsford, of the local contracting firm of A. E. Ponsford, Limited, feels confident that the newspaper report that his figure for the building of the heating plant of the new military hospital at London had been accepted, is true, as the $208,000 named in the despatch from Ottawa is the amount Mr. Ponsford named in his tender.

The contract is a large one and calls for the erection of the heating plant for all the buildings as well as the plumbing. An idea of the immensity of the job may be gleaned from the fact that seven large boilers are to be used for furnishing the steam. Mr. Ponsford will attend to the housing and setting of these boilers. The work will undoubtedly start as soon as the contract has been officially awarded.

SANITARY TOILETS FOR THE CEMETERY

A deputation from the St. Thomas Cemetery Board, consisting of Dr. F. E. Bennett and D. H. Newcombe, waited on No. 2 Committee of the City Council at their regular monthly meeting held recently, requesting the construction of a sanitary sewer from the West Avenue Mission to the cemetery gates, under the frontage tax system, in order that the cemetery board might carry out their arranged plans for erecting two modern toilets at the burial grounds in connection with the large new mausoleum that is to be erected there. Dr. Bennett, as chief spokesman, explained that the cemetery board at a recent meeting had made definite plans for constructing the new toilets in order to remove the unsightly and unsanitary toilets now in use and he asked the commitee to deal with the matter as quickly as possible.

While approving of the renovations and changes, the committee were unable to deal with the matter until the board of health had sanctioned the erection of the sewer.

TORONTO D. S. & H. E. SOCIETY MEETINGS

The above society held a most successful meeting on the occasion of their nomination night.

Election night was fixed for December 18 at 8 p.m., at the Canadian Foresters Hall, 22 College street.

The nominations were as follows: President, William Armstrong, Thomas H. Ferguson, A. S. Purdy, Fred. A Wiles; vice-president, Kenneth B. Allison, Norman Swanston; warden, George R. Baker, Roy E. Belyea; executive committee (nine to be elected), Kenneth B. Allison, George Clapperton, William J. Hall, Theo, Prince, Harry G. Waterman, William Armstrong, George H. Cooper, E. Lewis LeGrow, Alex. S. Purdy, Fred A. Wiles, Ross Belyea, Harry A. Farthing, Frank R. Maxwell, Thomas B. Smyth, John Wright, Charles H. Chapman, Fred. H. Gentle, Robert Paterson, Norman Swanston; trustees (six to be elected), George Clapperton, Thomas B. Smyth, George H. Cooper, Harry G. Waterman, Frank R. Maxwell, John Wright, George McGuire.

Upon the completion of the business of the evening, the east-end members engaged the west-end members in progressive euchre, with the east-enders proving the victors by 16 points.

Thomas Ferguson scored high points, having 33. Roy E. Belyea scored low points, having 14.

Refreshments were served by that congenial host, Wm. G. Schultz.

Overseas boxes were ordered to be forwarded to members of the society who are over there, in the persons of Messrs. Major Forbes Keith, Major Allen Keith, Sergt. Harry Ruddick, Corp. George Kirtley, Gnr. Harry Griffiths, and Spr. Albert Crowne.

Major Allen Keith has since returned home, having received slight shrapnel wounds in the arm and shoulder.

Frederick Sainsbury of Weston, a member of the Ontario society, has also returned after serving twenty months with the 2nd Div. M. T. C. in France. Fred says that as he was a plumber they made him into a tinsmith, and that was the only promotion he received, ending up with the comment, that he thought the promotion was very much on the Irish side. He says the work was pleasant, and while not in his particular line, all ended well, as those associated with him knew no more than he did.

A good attendance is looked for on election night, when Secretary Frankland's report on the Canadian Building Industries' conference will be presented.

Mr. Wm Redpath, manager of Pathescope of Canada, Ltd., will also entertain the company.

A TIMELY SUGGESTION

A subscriber to SANITARY ENGINEER writes us regarding placing our wounded soldiers in positions which their past experience fits them to hold.

For example: Why waste time retraining men who are qualified plumbers and steamfitters, and who, while they may be wounded in some way or other making them unfit to follow their work, would be quite alright to act as plumbing inspectors?

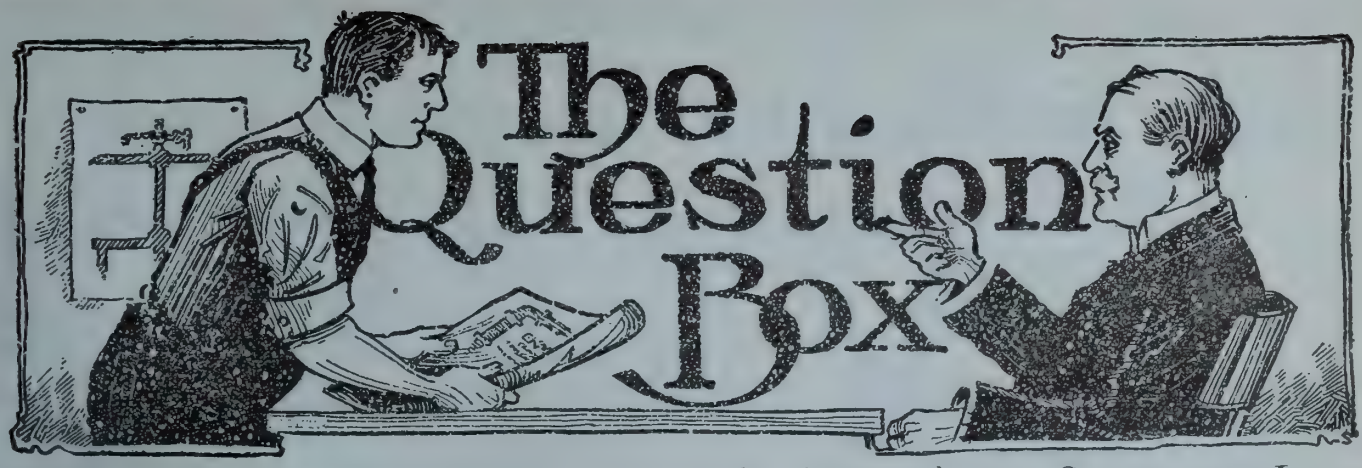
To this reader and others who may have not read articles previously published in this paper, we might say that SANITARY ENGINEER has been advocating such a scheme for over two years, and we have been informed that several towns have followed the suggestion. To be perfectly frank, the trouble is not with the Government, but rather with the tradesmen themselves, that is, the employers. While, as we stated before, articles have appeared from time to time in SANITARY ENGINEER advocating that the members of the trade get together and do some work themselves along this line, there has been no corporate action taken. We have every reason to believe that if the whole trade would make some move in this matter, that the Government would be only too pleased to listen to any suggestions given. Furthermore, the time is ripe just now to make some move, because of the fact that we have learnt that a Federal Department of Health is now under consideration.

CONTRACTS AWARDED

Toronto.—Alterations to office building for Department of Public Works, Toronto: Heating and plumbing, Purdy Mansell Ltd., 63 Albert St.

Foundation is in for a $4,000 residence for J. Carroll, 10 Kennedy Ave.: Plastering, Feast & Feast, 66 Runnymede Rd.;

(Continued on page 32)



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published--Description of Jobs Done or Shop Kinks Are Also Invited.

Trouble With Warm Air Heating Job

Editor SANITARY ENGINEER:—While I have had considerable experience in warm air heating, I must frankly admit that I am one of those fellows who follow practices I learned when working in the tinshop department, and am rather afraid I am doing lots of things by rote rather than by true scientific practice.

I am up against a job which I installed that is not sending sufficient heat up through the house, though the basement is always too hot. I want to procure a few pointers regarding warm air furnaces and how they should be installed so as to have a cooler basement, etc.—W. A.

Two things which are sadly neglected in warm air furnaces are the casing and the covering of the warm air pipes. Some of the finest and best designs of furnaces are not given fair treatment, and, therefore, do not give the results that they would, because of badly made casings and bare piping.

Ninety per cent. of the houses built to-day comprise basement, first and second floors, and possibly two rooms in the attic, and the basement, it would be safe to say, takes up at least 25 per cent. of the area of the whole house.

Now if we consider for a moment or two the amount of heating surface which is left exposed in the basement, it is no wonder that this part of the house is often warmer than it should be, to the disadvantage of the rooms above, which require the heat, and for which the furnace is really installed. The reason for this is that there is too much heating surface in pipes left bare, from which the heat escapes. This means that the furnace is generating heat, and that heat is being poorly distributed.

The remedy is, a casing with a good asbestos lining between the galvanized outer casing and the inside tin casing. The best form of asbestos, as far as experienced by the writer, is the air-cell asbestos. One ply is ample, providing the top and the bottom of the cells are closed up.

8he piping, too, should be covered with the same material. It can be fitted very easily and strapped on after the piping is installed, just in the same manner as is adopted when covering steam or hot water piping.

To fit this kind of asbestos on to the elbows, use the pattern of the elbow to cut the asbestos by, and very little waste will be made.

The single ply common asbestos paper is little improvement on common bare pipes.

In repair work, say a furnace too small has been installed, which is very often the case with houses that have been built for speculation. The writer has improved many a furnace by simply putting a single covering of air-cell paper on the outside of the casing, and, along with pipe covering, has made a furnace answer the purpose. To show how such a method will save fuel, or in some cases improve the distribution of heat units generated, we will assume that the basement is 25 per cent. of the total area to be heated, and the heat of the basement is 72 degrees Fah.; and we will also assume that the average heat of the rooms upstairs is 68 degrees Fah., without doubt the covering of the furnace and pipes will result in a conserving of heat, or rather reducing the temperature in the basement to approximately 62 degrees. Then by dividing the 10 degrees among the rooms above an approximate of 71 degrees will be procured; or if the rooms upstairs are warm enough, a saving of at least 10 per cent. on fuel can be effected easily.

Another very important matter which not only affects warm air furnaces, but all other furnaces too, is that of the chimney.

How many furnaces have been given a poor reputation because of a faulty chimney? A chimney may be too small in many ways. Some may be built a little lower than the ridging of the house, or it ay have another building soaring higher than it does, and thus obstruct the outlet at the top. Some authorities will allow a certain number of square inches to a given number of cubic feet of space to be heated, and do not take into consideration the shape of the chimney flue. This method is altogether wrong. The natural tendency of rising smoke takes the form of a spiral whether the smoke be enclosed or not.

Just to illustrate our argument—if a fire is built in the open and there is no movement in the air, it will be noted that the smoke will curl round and round in an upward motion. The same when enclosed in a chimney flue; therefore, if a round chimney is built, say 8 inches in diameter, it will have an area of 50,265 square inches, while the same chimney 8 inches square would have an area of 64 square inches, and would be none too large.

The accompanying table for chimneys ranging from 40 to 60 feet in height will be found a fairly safe rule to follow:

*TABLE OF CHIMNEY FLUE SIZES FROM 40 TO 60 FEET IN HEIGHT.

Cubic contents to be heated.	Round tile smooth pipe.	Brick inside dimensions.
10,000 to 15,000	8 inches	8 x 8 square
15,000 to 25,000	10 inches	8 x 12 rectangle
25,000 to 40,000	12 inches	12 x 12 square
40,000 to 75,000	16 inches	12 x 16 rectangle

*From Progressive Furnace Heating, by A. G. King.

Hamilton, Ont.—Four $2,000 residences for J. Butterworth, 183 Burris St.; plumbing, R. McArdle, 98 Wilson St.

$4,500, two-storey, brick residence for W. J. O'Reilly, 52 Colborne St.: Plumbing and heating, G. F. Mason, 467 College St.

Guelph, Ont.—Work has started for addition to apartment house costing $5,000 for J. A. McCrea, Park Ave.: General contractor and architect, W. A Cowan, Kathleen St.; plumbing, heating and electrical work, Grinyer & Co., Wyndham St.

FUEL MUST BE CONSERVED

Continued from page 27

conserved and it is especially advisable that there should be proper means taken to lessen the consumption of anthracite by those churches which cannot use bituminous.

Yours very truly,
(Signed) R. HOME SMITH,
Fuel Administrator for Ontario.

N.B.—As Forms are completed, kindly return to Mr. E. L. Cousins, Asst. Fuel Administrator for Ontario, Harbor Commissioners Building, Foot of Bay Street, Toronto.

The following is a copy of the circular referred to in one of the paragraphs in the above communication:—

To the Chairman and Board of
School Trustees.

Dear Sirs,—Conservation of the coal supply of this province is absolutely essential so that each and every one may be supplied in as full a measure as possible. Every pound of coal saved by anyone who has it within his power, means another pound that can go to fill some absolutely necessary requirement.

Soft coal must be used instead of hard coal, thus releasing anthracite for domestic use in stoves, ranges and heaters. This soft coal will go to fill a big gap in our anthracite coal requirements for this year.

The war being over will not in any great measure relieve the anthracite coal situation, consequently it behooves all to continue to effect as great a saving as before, and use soft coal in every place place possible.

You have a caretaker in your school in whom you have every confidence and who is careful, but it will be necessary to ask him to still further economize on the fuel for this year; and he probably knows where a saving can be made. Let himexplain these things to the board as he sees them and then put them into effect.

You may have this year a new caretaker, who is to a certain extent unfamiliar with the heating apparatus in your building. See that he acquaints himself with every detail in order to give the best possible service with the minimum expenditure of fuel. Explain if not already fully understood and appreciated that—

1. Particular attention should be given to keeping all the interior parts of the boiler or furnace, exposed to fire, perfectly clean. Every bit of dust or soot on these surfaces acts as an insulator and keeps the coal from doing the best work.

2. The fire should be regulated to suit the weather, as overheated rooms are as bad or worse than underheated rooms.

3. The building should not be heated fully except when school is actually in session, and ordinarily the fires should be reduced at least an hour before dismissal time.

4. After school has been dismissed for the day and the class rooms have been flushed out with fresh air, the cold air inlets to the ventilation system should be closed and remain so until starting time the following morning and all air exhausts from the rooms should also be closed.

5. Use the ventilation system during school hours only.

6. In warm weather, however, when no heat is supplied, the dampers may remain open.

7. No rooms should be heated to more than 68°, or at most 70° F.

8. Reliable thermometers properly placed should be hung in every room as a check.

9. Radiators not required in moderate weather should be turned off. When radiator inlet valves are turned down, they should be fully shut, and when they are opened they should be fully opened.

10. If you have a steam heating system see that the air or exhaust valves on the radiators (where such are now in use) are in proper working order and that they are not tampered with.

11. The draft doors on the boiler (in the ash-pit doors) should not be kept open too long and the fire should be run under check as far as possible.

12. The ash-pit should be kept clear of ashes.

13. Steam (where this is the method of heating) should never be carried at too high a pressure—2 lbs. on the gauge should be sufficient and never over 5 lbs.

14. Outside doors of the building should be kept closed when heat is required.

Kindly take this matter up with your Board and others concerned, explaining the immediate necessities existing, and complete and return the form which will be handed to you by the Fuel Commissioner.

The hearty co-operation of the principal, teachers and caretakers will accomplish great results.

Yours truly,
R. HOME SMITH,
Fuel Administrator for Ontario.
E. L. COUSINS,
Asst. Fuel Administrator for Ontario.

It can readily be seen that if all heating appliances were installed properly and were inspected at regular intervals, millions of tons of coal would be saved in a very few years. And it would be far more economical to have all heating systems under some constructional control than pay transportation charges, as well as waste enormous sums of money in firing same into furnaces and boilers only to go up in smoke.

When a Dominion Fuel Controller can gather men around him that are qualified to draft such forms out such as are here produced, it cannot be denied that these same officials, if given power to act, could draft a standard heating law that could be enforced from coast to coast.

There is no doubt about the matter. It is as clear as day. That to properly conserve fuel it must be kept out of the fire box. And not only so but no building should be allowed to be erected, no matter for what purpose, that has more than a certain heat loss. The average residence is by far the biggest fuel waster, because, as admitted not very long ago by a city architect in one of our largest Canadian cities, there is no jurisdiction over the methods adopted in making a building wind or weather proof. We have published article after article in SANITARY ENGINEER urging that there be some form of heating by-laws put into force, and if such an ordinance were in operation buildings would at once require to be more substantially built.

Not only so, but heating appliances of all kinds would be installed that will do their part in saving coal.

CONTRACTS AWARDED

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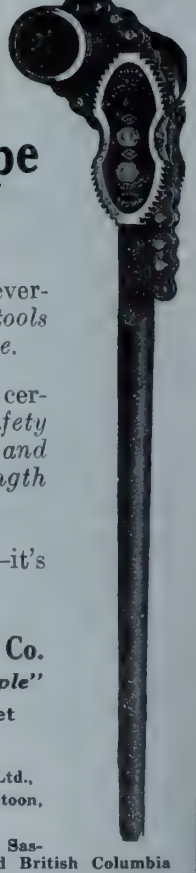
plumbing and heating, Adams Bros., care of owner.

Walls are being erected for a $4,000, 2½-storey, brick residence for F. A. McCabe, 18 Willard Ave.: Plumbing, I. Maude, 19 Rowland Ave.; wiring, Dunn & Wilkinson, 3124 Dundas St. W.

Roofing has started for two two-storey, brick residences costing $7,000 for George McWilliams, 205 Beresford Ave.: Masonry and carpentry, T. W. Robinson, 11 Evelyn Cres.; plumbing, E. Hulme, 49 Vine Ave.; heating, Wm. Howard, 74 Borden St.

Excavating has started for a $3,500, two-storey, brick residence for L. L. Conley, 333 Harbord St.: General contract, masonry and carpentry, T. W. Robinson; plumbing, E. Hulme; heating, Wm. Howard.

Williams' Improved Chain Pipe Wrench



Double-ended reversible jaws—*Two tools at the price of one.*

Proof-tested and certified chain — *Safety for the operator and guaranteed strength for the wrench.*

Ask for Booklet—it's free.

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"The Wrench People"
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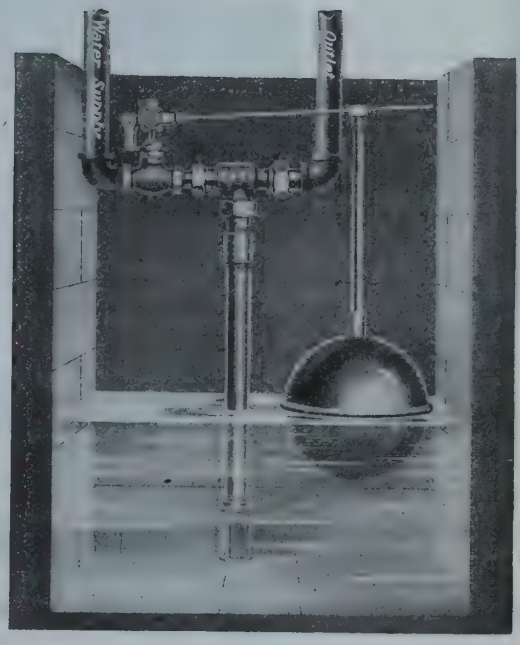
The A. G. Low Co., Ltd.,
77 Pacific Ave., Saskatoon, Sask.

Agents for Manitoba, Saskatchewan, Alberta and British Columbia

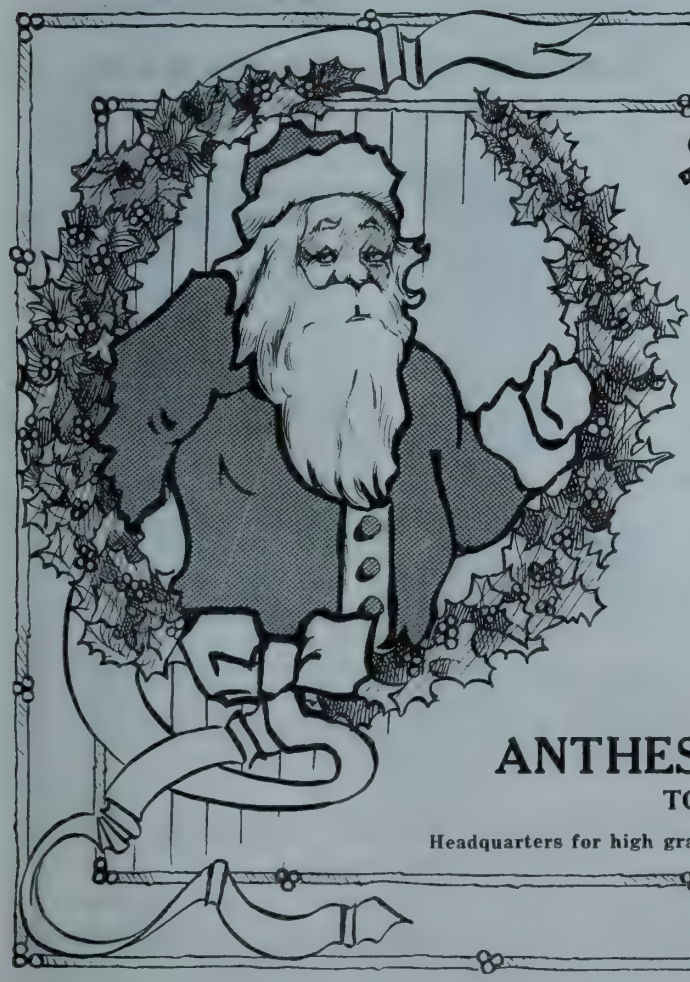
No Cams or Levers to get Out of Order In *Morrison* Cellar Drainers!

All working parts in Morrison Cellar Drainers are placed *above water*. There are positively no complicated cams or levers to get out of order. Still another advantage is that it takes up very little space and is installed easily.

There never was a better cellar drainer and what we ask is a chance to prove it next time you need an apparatus for this service.



The James Morrison Brass Mfg. Co., Limited
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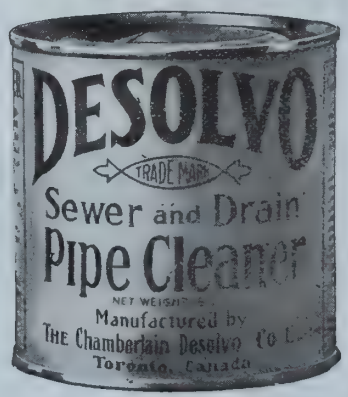
YULETIDE GREETING.

TO every sanitary engineer in Canada—

We hope, as the war is now practically over, that the period of industrial progress will soon have gained momentum, and that wars and rumors of wars will be for ever a thing of the past.

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Pipe and the Public Welfare

By R. C. McWane

A Book Just Off the Press

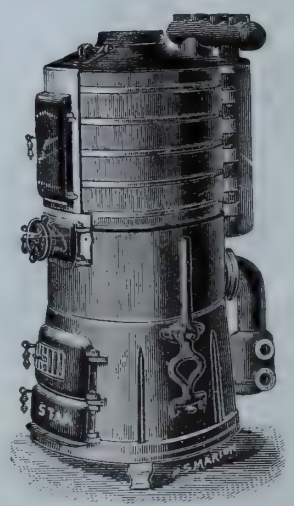
Every sanitary engineer should be the possessor of this book. It deals with pipe making of all kinds, cast iron, wrought iron, steel, wood and tile pipe. It is valuable because it gives the users of pipe a true idea of how pipe lasts under various conditions when in service.

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The principal feature of the Star Boiler is that **no other round hot water boiler has any coal-saving improvement not embodied in the "Star."**

Then, too, while boiler installation and repair time is here, why not stock up with Star parts, for which O. Belanger has taken over the rights and is now making?

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Write to us at once in time to catch the season's business.

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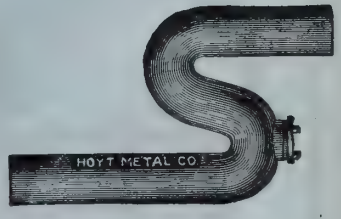
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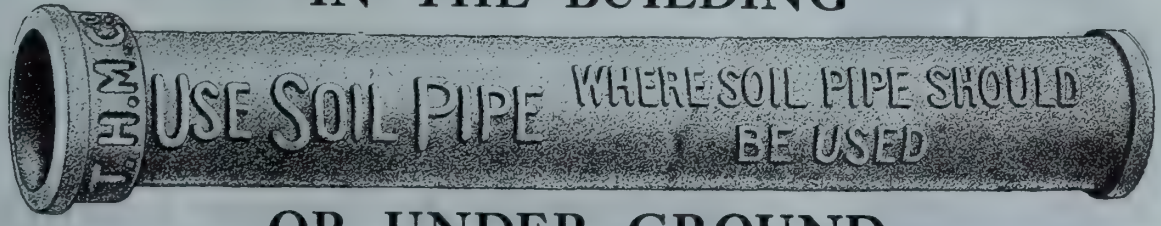


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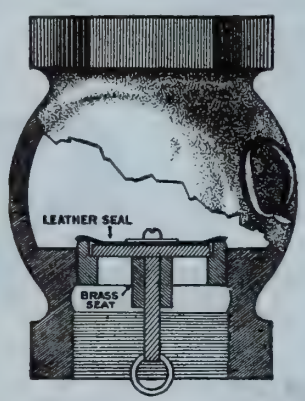
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This is a personal message to you. Kindly read every word—you owe it to yourself to do so.

THE thing every steamfitter prizes most highly is his reputation. Without it his standing with his customers—his business—everything is *valueless.*

When a customer calls you in to repair a leaky or cracked boiler you feel it your duty to give him a good job. That's the *only* way to make money. If your judgment tells you it's the kind of job on which to use "X" Liquid—your reputation is at stake if "X" doesn't make good. That is why we take so much care in making "X"—and seeing that it gets to you sealed—branded—and in good condition.

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So we owe it to our friends to warn them that there is no other product on the market that can do what "X" does. "X" is the ONLY *Scientific* Process of repairing leaky and cracked boilers—and for making them LEAKPROOF—RUST-PROOF—and SCALEPROOF.

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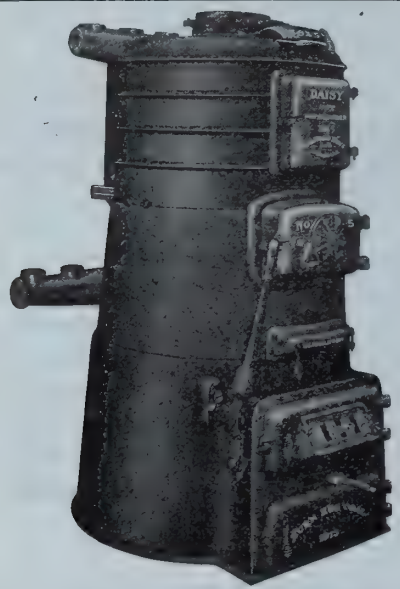
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All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

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PIPE AND THE PUBLIC WELFARE

By R. C. McWANE

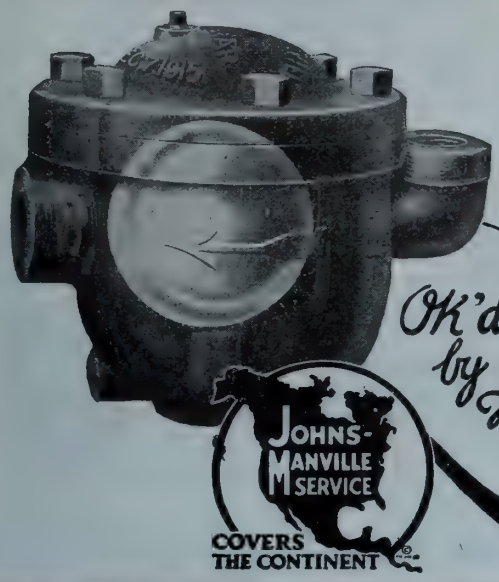
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Every sanitary engineer should be the possessor of this book. It deals with pipe-making of all kinds, cast iron, wrought iron, steel, wood and tile pipe. It is valuable because it gives the users of pipe a true idea of how pipe lasts under various conditions when in service.

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This is a continuous discharge trap. Its only working part—a rolling ball—does everything that tilting buckets, floats, rods and trunnions do, but it cannot jam, break or stick.

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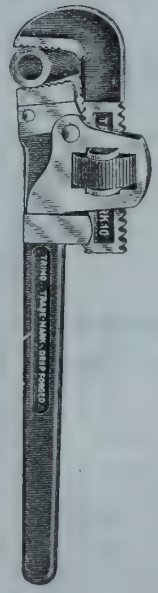
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Ratchet	Geared
No. 6—¼″ to ¾″.	No. 41—2½″ to 4″.
No. 25—1″ to 2″.	No. 61—2½″ to 6″.
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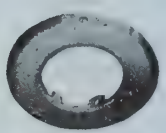
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Toronto, Ont.



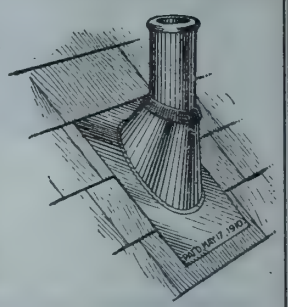
No. 16

The Beaton & Corbin Mfg., Co.
Southington, Conn., U.S.A.
The Old Original Company



No. 17

The SIMPLEX Adjustable Roof Flange



Fits any roof from ½ pitch to flat—just slide it down the pipe and it will conform with the pitch of the roof.

Trade Price 2″ $1.00 4″ $1.15

Made in all sizes—For sale by nearly every jobber

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Canadian Representative: W. H. CUNNINGHAM & CO.,

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Second-Hand Pipe

1-2″ to 4″

Black and Galvanized

Send us list of your requirements

Consumers Metal Company, Limited

14 St. John Street MONTREAL

Works: LACHINE, QUE.

"HAUSE" PIPE JOINT CEMENT

For steam, water, air, oil, gas, gaskets, etc. The cement that cements. Sets like gum. Allows no leaks.

The Great Value of "HAUSE PIPE JOINT CEMENT" lies in its peculiar chemical properties which permits of its hardening and expanding after the joints are made up. In making up joints it has the same effect as a lubricant on the best graphite, and while the joints may be made and broken readily, a perfectly tight joint is maintained at all times. Comes in 1-lb., 5-lb., 15-lb., 25-lb., 50-lb. cans, 100-lb. barrels. Manufactured in ready mixed and powder form. Ask your jobber for prices, or write us direct.



Manufactured in Ready Mixed and Powder Form.

Made in Omaha, Neb., U.S.A.,

Canadian Distributors:

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It's a real little wind engine



Is a positive suction fan that ventilates

The "Bicalky" will dispense with all auxiliary heaters on local ventilation systems.

It is, as far as we know, the most scientifically constructed, self-propelled fan ventilator on the market.

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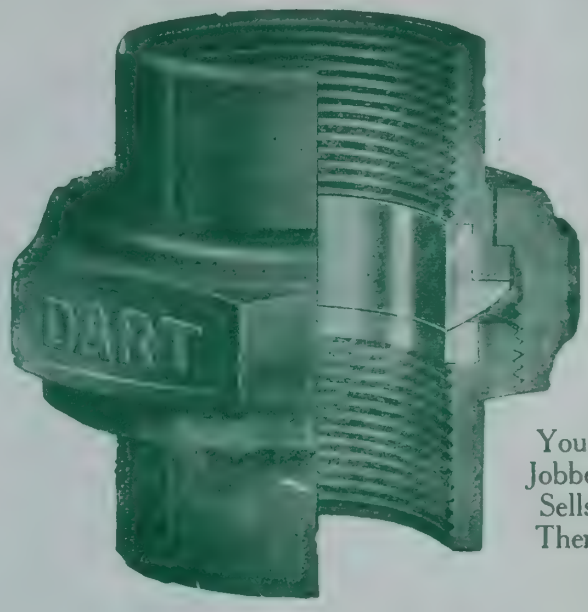
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Pipe Coupling

Made in Canada by

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Your Jobber Sells Them

(1) EASILY CONNECTED

A ball-shaped joint that makes the connection whether pipes are in or out of alignment—so long as the nut can be started on its thread.

(2) PERMANENTLY TIGHT JOINTS

No deterioration of any kind at the joint, nor will the heavy iron parts stretch or pull apart.

(3) DURABILITY

The Bronze to Bronze, non-corrosive joint and solid parts eliminate replacement. The union can be connected time after time without expense or bother.

(4) ECONOMY

No upkeep cost. No replacement cost. No loss from leaks.

(5) GUARANTEE

We will replace **two** for **one** any union bearing our trade-mark that does not give absolute satisfaction and fulfil our claim.

(6) CUSTOMERS

The utmost satisfaction is given your customers —satisfaction that makes for you their future business.

There Are Lots of Gate Valves

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but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.

Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.

Approved by the Fire Underwriters' Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario

Greetings

LET US ALL GIVE THANKS

"That peace and plenty doth abound,

That War is stilled from every sound."

May it never again be the lot of humanity to have to put on the armour of War. But rather that the spirit of Christmas shall be lived by all, three hundred and sixty-five days in the year.

With those wishes we ask every member of the sanitary and heating trade to accept the compliments of the season.

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SOLE MANUFACTURERS OF

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